Me 262 VS P-51 MUSTANG

Europe 1944–45

ROBERT FORSYTH

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INTRODUCTION

In the unseasonably stormy summer skies of July 28, 1943, the USAAF's Eighth Air Force despatched 302 B-17 Flying Fortresses to bomb the Fieseler aircraft works at Kassel-Batteshausen and the AGO aircraft plant at Oschersleben, both in Germany. This was the "Mighty Eighth's" 78th such mission to Europe since the start of its strategic bombing operations from bases in England in August of the previous year. On this occasion, for the first time, and at least for a part of their journey into the airspace of the Reich, the bombers would enjoy the security and protection of P-47 Thunderbolt escort fighters. The latter had been fitted with bulky and unpressurized auxiliary fuel tanks that were normally used for ferry flights, but which greatly extended their usual range. Yet even with this extra fuel, the P-47s could only stay with the bombers for *part* of their journey.

Herein lay a dichotomy. Despite warnings to the contrary from their Royal Air Force (RAF) counterparts, senior staff officers in the USAAF believed in the viability of undertaking future *unescorted* daylight missions to key targets within Germany. In January 1943 Prime Minister Winston Churchill and President Franklin D. Roosevelt met in Casablanca to determine a plan for Allied victory. It was here that the philosophy of daylight precision bombing of German targets was given the seal of approval by Allied leaders, who were anxious to hone an air strategy that would swiftly and effectively destroy the Third Reich's industry and its "will to resist." Thus, although Allied strategic aspiration was to penetrate ever deeper into enemy territory so as to reach and destroy more of Germany's manufacturing and industrial plants, as well as its transport infrastructure, such operations became increasingly riskier the further east the bombers flew.

On July 28, the Luftwaffe, aided by an increasingly sophisticated defense and communications network, and ever alert to the Americans' tactics, waited until the

P-47s had to turn back before launching a concentrated attack in bad weather on the then vulnerable bombers. Ten *Jagdgruppen* were assembled in defense, together with a specialist anti-bomber weapons development unit and a handful of factory defense flights.

The Fw 190s and Bf 109Gs charged their way into the American formations in head-on attacks. In one of their first major deployments, new types of weapons intended specifically for use against the *Viermots* ("four-motors" – Allied four-engined bombers) were used in the form of underwing 21cm mortar tubes. Fired from beyond the defensive range of the bombers, the mortar shells were intended to detonate within, or even near to a formation, causing sufficient blast effect to break it up and leaving bombers isolated and straggling. One Flying Fortress from the 385th Bombardment Group (BG) received a direct hit, broke up and crashed into two other B-17s, causing all three aircraft to go down. In another example of "innovation," one Fw 190 pilot claimed three bombers destroyed after he dropped a bomb into the American formation.

The USAAF lost 22 bombers in total, with three more written off after crash-landing upon their return to England.

For the Luftwaffe, these encouraging results were tempered by the unexpected clash between P-47s of the 4th Fighter Group (FG) sent to cover the B-17s' withdrawal and a mixed formation of Fw 190s and Bf 109s that was in the process of launching an attack against the bombers near Emmerich. In a running engagement between Utrecht and Rotterdam, the Americans claimed nine German fighters shot down.

Nevertheless, the losses suffered by the B-17s that day served as another stark reminder to the Eighth Air Force of the heavy bombers' vulnerability when unescorted. Clearly the bomb groups were unable to defend themselves, and the grim prospect of further losses in aircraft and hundreds of crewmen hung heavily over USAAF senior commanders – particularly Lt Gen Henry "Hap" Arnold, the Commanding General of the Army Air Forces. The solution as Arnold saw it – indeed the *need*, and it was needed urgently – was for a fighter that had sufficient range to fly with the bombers all the way to Germany, to any target, even to Berlin and back. Was that indeed possible, and even if it was, how long would such an aircraft take to arrive with the squadrons in England?

In fact, the solution was on its way in the form of the P-51 Mustang – an aircraft that had been built by North American Aviation in the US but used operationally by the RAF, who christened it after the feral horses that roamed the Great Plains. Its use by the USAAF, however, had been the subject of procrastination and delay – a delay that had proved costly in terms of the numbers of bomber crews that had already been shot down over Germany by the time of the re-engined B-model's eventual deployment as an escort.

On November 11, 1943 – 15 weeks after the Kassel and Oschersleben mission, by which time the Eighth Air Force had flown another 49 bombing raids and, in the process, suffered many more losses in aircraft and crews – the first of the new P-51B Mustang fighters arrived in England. However, with the agreement of the Eighth Air Force's commanding general, Lt Gen Ira Eaker, these aircraft were assigned to the Ninth Air Force's 354th FG, which would use them to fly tactical army support missions.

This was not an ideal situation for the bomb groups of the "escort-starved" Eighth Air Force, which were losing aircraft to Luftwaffe fighters in record numbers. In a

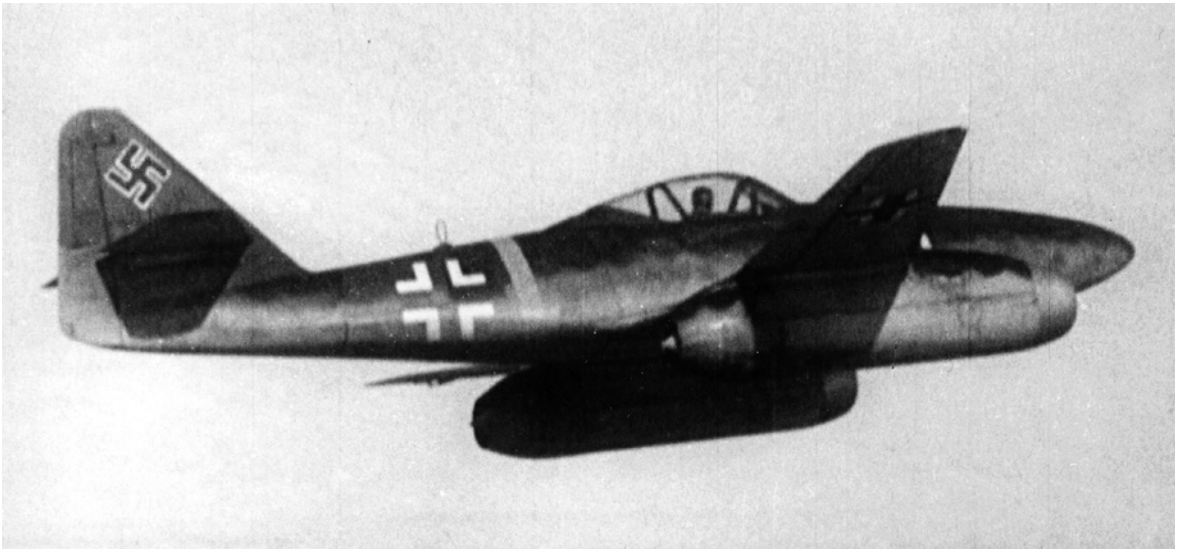
serendipitous move, the tactically astute and combat-seasoned Executive Officer of VIII Fighter Command's 4th FG, Lt Col Don Blakeslee, was assigned to the 354th FG to oversee the group's introduction to combat in the European Theater of Operations (ETO). He became a firm advocate for the P-51B, which was the original Mustang airframe fitted with the Packard license-built version of the British Rolls-Royce Merlin 61 engine. This combination gave the B-model a high top speed and a good rate of climb.

"The P-51 Mustang was a little slow in coming to us in England," Blakeslee recalled many years later, "but I knew the first time I flew it that it was the plane to do the job. When the P-47s arrived in late 1942, they were a great improvement, but still not the full answer range-wise. The P-38 was supposed to be the USAAF's best long-range fighter, but there were no P-38 groups in the ETO before late 1943. Things began to change when we were told we had to gain air superiority over the Luftwaffe before an invasion could take place. The German pilots would not tangle with us as often as we wanted, therefore making it difficult to destroy them. Then, in December, the 354th FG began operations with Mustangs and, finally, in early 1944, the Eighth Air Force began receiving them. We now had plenty of fuel to loiter around the bombers, chase the Luftwaffe, or go to the deck and strafe at will. No area of the ETO was out of reach."

Seven months earlier in Germany, Hauptmann Wolfgang Späte, a 72-victory Knight's Cross-holder and former *Staffelkapitän* of 5./JG 54, flew the second prototype of a pioneering fighter. The Messerschmitt Me 262 had first taken to the air using state-of-the-art Junkers Jumo 004 jet engines on July 18, 1942.

Since the late 1930s, German aircraft designers and aeronautical engineers had been at work developing a new technology in the form of the turbojet engine. It had been the Heinkel company that had first got an aircraft powered by jet engines into

Photographed from a 91st BG B-17 over eastern England, P-51D 44-13926 of the 375th FS/361st FG is seen here with 1Lt Urban Drew at the controls on July 26, 1944. The aircraft was written off exactly two weeks later when, during a training flight, 2Lt Donald D. Dellinger crashed near Stalham, in Norfolk, and was killed. (USAF)



The elegant, well-proportioned design and swept-back wings of the Me 262 are shown to advantage in this view of A-1a Wk-Nr 110926 "White 10" of III./EJG 2 based at Lechfeld. (EN Archive)

the air when the He 178 V1 flew for the first time on August 27, 1939 powered by a 1,100lb-thrust HeS 3b engine designed by Hans von Ohain. In February of the following year, Ernst Heinkel's contemporary, Professor Willy Messerschmitt, had enhanced the design of his P 1065, a project which had been intended to fulfill a *Reichsluftfahrtministerium* (Reich Air Ministry (RLM)) specification dating from January 1939 that called for a high-speed interceptor, capable of a maximum speed of 560mph and to be powered by a single, unspecified jet engine.

Construction of the first P 1065 prototype took place between February and March 1941, the project receiving the official RLM designation "Me 262" on April 8, by which stage the design had incorporated two Jumo jet engines.

Two days after his flight (on April 17, 1943), Späte reported to the *General der Jagdflieger*, Generalmajor Adolf Galland, that ". . . flight characteristics are such that an experienced fighter pilot would be able to handle the aircraft. In particular, the increase in airspeed when compared to the fastest conventional fighter deserves attention. This is not expected to decrease markedly when armament and radio equipment have been fitted . . . Characteristically, jet engines will not only maintain this speed at altitude, but increase it. The climbing speed of the Me 262 surpasses that of the Bf 109G by five to six meters per second. The superior horizontal and climbing speeds will enable the aircraft to operate successfully against numerically superior enemy fighters. The extremely heavy armament – six 30mm guns – permits attacks on bombers at high approach speeds with destructive results, despite the short time the aircraft is in the firing position."

When it came, the meeting of the more refined P-51D Mustang and the Me 262A-1a jet interceptor in the skies over Germany in 1944–45 represented what was arguably the zenith of wartime piston-engined fighter propulsion and combat maneuvrability, and the dawn of the future of aircraft propulsion.

This book will examine each of these extraordinary aircraft and examine how they performed when pitted against each other in a relatively short period of time, but at a point in the air war that was critical for both the USAAF and the Luftwaffe.

CHRONOLOGY

1927

September 8 The young aircraft designer Willy Messerschmitt joins the Bayerische Fluzeugwerke (BFW) at Augsburg, taking over project development.

1934

July 6 James Howard "Dutch" Kindelberger, former President of Engineering at the Douglas Aircraft Company, joins North American Aviation as company president.

1935

January 1 Under Kindelberger and former Douglas men John Leland Atwood, as chief engineer, and James Stanley Smithson, as designer, North American Aviation is incorporated and commences business as an aircraft manufacturer in Dundalk, Maryland.

1936

January North American Aviation relocates to a new factory in El Segundo near the southeast corner of Los Angeles Municipal Airport with 250 employees. The move to the favorable conditions of California offers all-year flying.

1939

December Work commences on the Jumo T1 (004 A), forerunner of the Jumo 004 turbojet engine, at the Otto Mader Werke in Dessau.

1940

October 26 First flight of prototype NA-73X in Los Angeles, with Vance Breese at the controls.

1942

June US government places order for 310 P-51As.

July North American Aviation submits specifications for the NAA-101 (XP-51B).

July 18 Messerschmitt test pilot Fritz Wendel makes first turbojet-powered flight in Me 262 V3 (third prototype) at Leipheim.

November 30 North American Aviation chief engineering test pilot Robert C. Chilton flies the first Merlin-powered XP-51B.

1943

April 13 First production order for 2,500 P-51Ds.

May 5 First production P-51B-1-NA flight-tested at Mines Field (the site of today's Los Angeles International Airport.

December 1 Ninth Air Force's 354th FG undertakes its first mission (a sweep over Belgium) to give the P-51B its operational debut.

December 13 Mustangs fitted with two 92 US gallon internal wing tanks and either two 75-gallon or 150-gallon external tanks fly their first long-range escort mission – 490 miles to Kiel and back, which establishes a record at the time.

1944

February 11 357th FG becomes the first fighter group assigned to VIII Fighter Command to see combat with the P-51B.

March P-51D starts to replace the B-model in production.

James "Dutch" Kindelberger (left), the hardworking, extrovert head of North American Aviation, and John Leland Atwood, the company's Vice President, who joined the company from Douglas in 1934 – Kindelberger had also worked there as an engineer. Together, they became a formidable combination and built North American Aviation into a highly successful business, with the P-51 being one of its most renowned designs. (San Diego Air & Space Museum)

March 4 First long-range bomber escort mission reaches Berlin when 121 Eighth and Ninth Air Force P-51s escort a force of 502 B-17s to the German capital and back again for the first time.

April–July First Me 262s reach the Luftwaffe with *Erprobungskommando* 262 at Lechfeld.

July 26 or 27 Leutnant Alfred Schreiber of *Erprobungskommando* 262 claims a Mosquito shot down for what is believed to be the first aerial victory for the Me 262.

October 7 1Lt Urban L. Drew, flying a P-51D of the 375th FS/361st FG, shoots down two Me 262s of *Kommando Nowotny* while over Achmer, claiming the first such victories for the P-51D.

November 8 Leutnant Franz Schall of 2./*Kommando Nowotny* claims three P-51s shot down for his 120th–122nd victories.

1945

April 10 Capt Gordon B. Compton of the 350th FS/353rd FG claims his second Me 262 kill to become one of nine USAAF pilots to claim a pair of Messerschmitt jet fighter victories. Leutnant Franz Schall of 10./JG 7 claims his tenth P-51 (his 133rd, and final, victory of the war) that same day.

DESIGN AND DEVELOPMENT

P-51 MUSTANG

The story of the P-51 Mustang is one founded on superlative airframe and engine design, perseverance, collaboration, urgent strategic requirement, industrial might, and excellent execution – with a measure of what might be called aeronautical serendipity.

What became the P-51 first saw service with the RAF as the Mustang following a British Air Purchasing Commission requirement of April 1940 for an advanced fighter built in the US under the project designation NA-73. On offer initially to the British was the Curtiss P-40 but, in reality, the aircraft's manufacturer was already fully committed to building the fighter for home service and was therefore unable to release production capacity for the overseas requirement.

Meanwhile, North American Aviation had undertaken some fighter work for foreign customers during the mid-1930s under the direction of its highly creative and inventive head of preliminary design, Edgar Schmued. The British Air Purchasing Commission was reasonably comfortable with the company, having purchased examples of its AT-6 Texan trainer (which was christened the Harvard in RAF service).

Edgar O. ("Ed") Schmued was born in Hornbach, Germany, on December 30, 1899, the son of a dentist. As a boy, he was transfixed by the sight of the first aircraft he saw. His father was more than willing to allow his son any aviation reference or

German-born Edgar Schmued, the highly focused and innovative North American Aviation designer-engineer, studies a model of what is regarded as his finest creation – the P-51 Mustang. (San Diego Air & Space Museum)

technical book he desired since there was little money available for a formal education. However, because of the prevailing adverse economic conditions, and the limitations on the development of aviation imposed upon Germany by the Treaty of Versailles, Schmued left his homeland in 1925 and went to Brazil, where he tried, unsuccessfully, to convince local investors to back his proposals for a start-up aircraft company.

Subsequently, he joined the service department of General Motors Corporation's Brazilian operation. In 1930 he decided to emigrate to the US, and applied to join the New Jersey-based Fokker Aircraft Corporation of America as a designer, this company being owned by the General Motors Corporation. Within four weeks he was appointed head of what he described as "the first preliminary design department in the US."

General Motors Corporation later sold Fokker to the General Aviation Corporation, which eventually became North American Aviation. After a spell in Maryland, the company commenced its move to a new factory in El Segundo near the southeast corner of Los Angeles Municipal Airport, in 1935. Here, the favorable weather conditions of California allowed all-year flying. That same year, Schmued became an American citizen. Tragically, however, he and his wife were involved in a head-on collision while driving to California on Route 60 and his spouse was killed, while Schmued was seriously injured.

41-038 was one of two NA-73 XP-51 models built at Inglewood and ferried to Wright Field in Dayton, Ohio, for assessment by USAAC Materiel Command. It was then flown to NACA at Langley, in Virginia. This machine – which still survives today – was delivered to Langley in December 1941. (NASA)

After recovery, he was engaged by James "Dutch" Kindelberger, the head of North American Aviation. Schmued would duly work under Kindelberger on the less than successful NA-50 (a simple single-seat monoplane fighter intended for Peru) and the later NA-68 of 1940 for Thailand – these aircraft became P-64s when their export clearance was canceled and they were returned to the United States. Disarmed, the aircraft were used as advanced fighter trainers by the US Army Air Corps (USAAC).

Drawn to the superior P-40, however, officials of the British Air Purchasing Commission (specifically Sir Henry Self, Air Vice-Marshal G. B. A. Baker and H. C. B. Thomas) enquired whether North American Aviation could build the Curtiss aircraft under license. Kindelberger responded by stating that his company could design an entirely new fighter with superior performance in the same time needed to set up assembly for the P-40. The aircraft was assigned the project number NA-73.

Schmued was part of the team that produced the drawings of the NA-73, his work being overseen by Raymond H. Rice, North American Aviation's chief engineer since 1939. Along with chief aerodynamicist Edward Horkey and draftsman Herbert W. Baldwin, they produced profiles and a general arrangement with dimensions that remained in place until the Merlin engine and bubble canopy modifications of late 1942. When creating these drawings, Horkey and his staff employed the new mathematical "second degree curve development" that had not previously been incorporated into aircraft design.

Once the drawings had been completed, Kindelberger and the Vice President of North American Aviation, John Leland Atwood, traveled from California to New York to spend three weeks in the converted hotel space used by the British Air Purchasing Commission. Here, with the aid of the drawings and preliminary weight estimates, they convinced the British representatives that the NA-73 was the machine they were

looking for – this despite the fact that North American Aviation had never previously built a modern fighter aircraft.

The British officials approved the preliminary design on May 4, 1940, but with the insisted stipulation that North American Aviation obtained all relevant wind tunnel data on both the P-40 and the XP-46. The latter was a development of the Curtiss fighter with a rear radiator installation that the British Air Purchasing Commission was also keen on acquiring. It also added the armament requirements for the NA-73. Next, Atwood journeyed patiently to Curtiss in Buffalo, New York, where he handed over $56,000 to purchase the required data as the British had requested. However, upon his return to Los Angeles, Ed Horkey considered the XP-46 to be both obsolete and amateurish. The data was, to all intents and purposes, discarded.

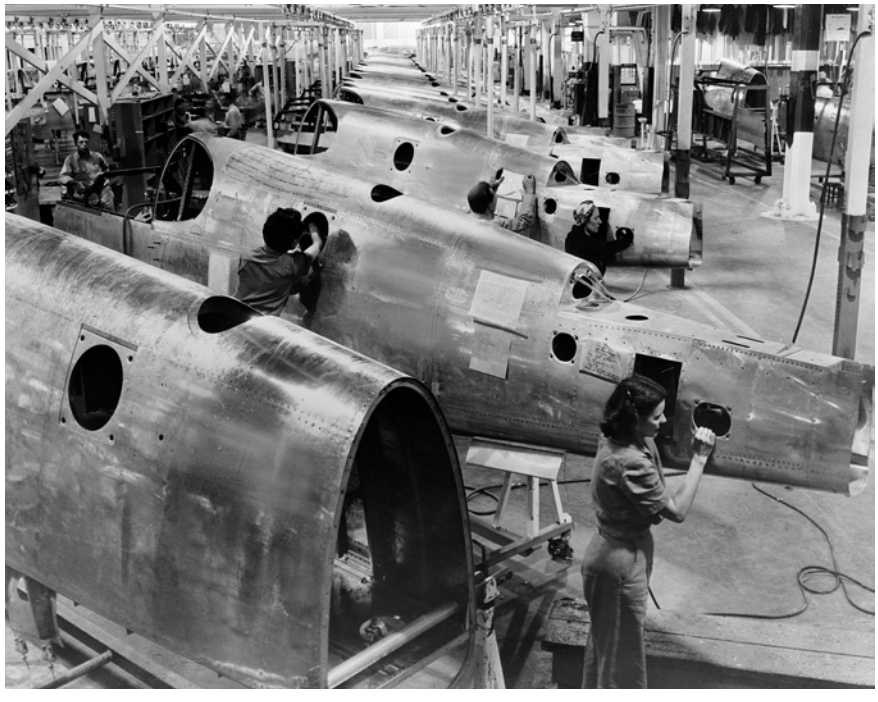
North American Aviation technicians perform final checks on what is either an NA-73 or early-build Mustang I intended for Britain prior to the aircraft completing its first test flight at Inglewood in October 1942. Note that there is no rear window panel aft of the cockpit. (Library of Congress)

Having agreed with North American Aviation a unit price of $50,000 for each NA-73, the British Air Purchasing Commission placed a firm order on May 29 for 320 aircraft to be built at Inglewood. The project design was then christened "Mustang" in the way RAF aircraft were given names, such as "Spitfire" and "Hurricane," rather than the less romanticized style of alpha-numeric designations. The US War Department gave its final ratification on September 20 for 320 aircraft, which included two examples for the USAAC.

Over the next four months Schmued and Horkey set about the very real business of creating the NA-73 warplane from their original drawings. Dedicated, committed, and diligent, they worked all day, many nights, and also weekends in pursuit of their objective. As part of the process, they ensured that the prototype would feature elements of construction that could easily be transferred into mass production methods. As each section of the aircraft was designed, so that part of the assembly line was planned – in much the same way as an automobile production line was laid out.

Ultimately, after the expenditure of 60,000 man hours by the design team, no fewer than 2,800 further drawings were produced. The team's design was based on a V12 inline engine that allowed a smooth nose and a frontal area of minimum drag. To optimize speed, Schmued and Horkey wanted an airframe with the lowest level of airflow resistance, but they allowed for a distinctive coolant radiator for the liquid-cooled engine located on the underside of the fuselage aft of the cockpit in a way that was similar to the British Hawker Hurricane and, although not in the same position, the P-40 and the ensuing XP-46.

The engine selected by North American Aviation was the 12-cylinder Allison V-1710-39, rated at 1,120hp on take-off. This powerplant was also used in the P-40. Delivery of a unit for the prototype was delayed because the NA-73X was considered a private venture, and thus not deemed by the US government to be an urgent requirement – it needed all the V-1710s it could get hold off to power P-40s that had been ordered in growing quantities following the outbreak of war in Europe.



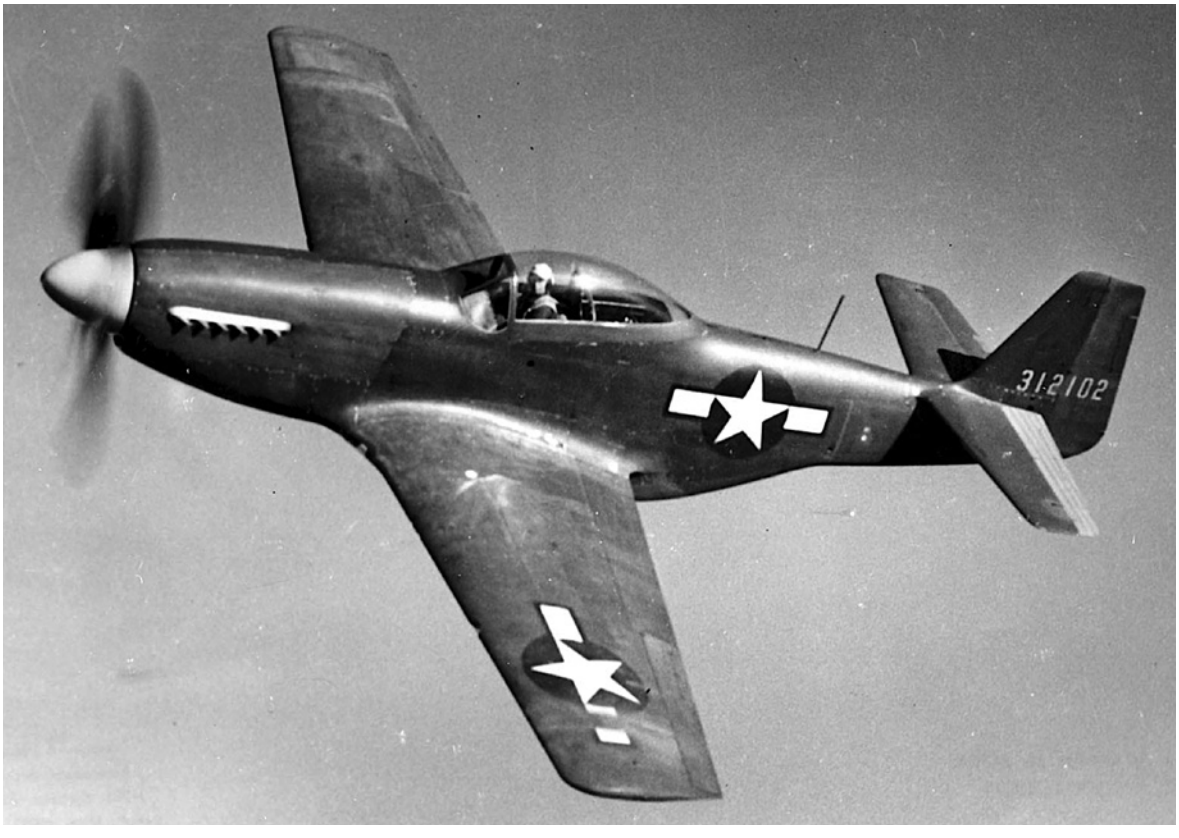
Male and female employees of North American Aviation work on P-51B fuselages on the overhead conveyor line at the company's Inglewood plant. The latter produced 6,502 P-51Ds using the most advanced manufacturing methods, with an additional 1,600 D-models being manufactured at the company's Dallas plant. (Library of Congress)

With its outer wing panels removed and fitted with a modified production scoop, an XP-51B is suspended for testing in the NACA 16ft high-speed wind tunnel at Ames Aeronautical Laboratory at Moffett Field, California, 40 miles south of San Francisco. North American Aviation designers believed that tests in the tunnel could reveal the source of vibrations quicker than flight testing. The first test runs traced the vibration to the belly scoop, and thus its leading edge was subsequently lowered until it was outside the fuselage boundary layer. Note the turntables in the walls intended for pitch adjustment. (NASA)

On the morning of October 26, 1940, after 102 days' work at Inglewood, the all-metal, stressed skin NA-73X prototype took off on its first flight from Los Angeles with Vance Breese at the controls, the fighter having been fitted with an Allison earlier in the month. All went well during the flight, which lasted little more than 20 minutes, and the aircraft landed safely back at Mines Field. However, just under a month later on November 20, there was a blow to the program when the NA-73X crashed into a field on its landing approach while being flown by North American Aviation's chief test pilot, Paul Balfour, the result, apparently, of him forgetting to switch fuel tanks.

With fuel exhausted and the aircraft gliding, it was said that Balfour had lost height too quickly. The NA-73X nosed over, trapping the pilot in the cockpit. Fortunately, it did not catch fire or explode. Another theory attributes the crash to the initial short design of the early carburetor scoop which was unable to intake air at high angles-of-attack. Nevertheless, officially, fuel starvation was seen as the cause, which meant the aircraft was cleared of any technical failings. The project forged ahead.

When the Mustang entered service, the Allison was found to perform well at low to medium altitudes, but from 11,300ft power would start to drop off at full throttle and by 15,000ft performance had ebbed away rapidly. The RAF accepted this, and duly deployed the aircraft in tactical fighter and reconnaissance roles rather than in higher-altitude fighter/air



The XP-51D prototype fighter in flight on November 17, 1943, with Bob Chilton at the controls. This aircraft (43-12102) was modified from a standard P-51B-1 airframe taken from the production line at Inglewood and fitted with a new Plexiglas "bubble" canopy. However, the B-model's wing was retained, with two guns per wing and a landing light in the leading edge of the left wing. (San Diego Air & Space Museum)

superiority missions – the latter were left to the Spitfire V/IX. The story remained the same for the first Allison-engined Mustangs, known as the P-51 and P-51A, delivered to the USAAF from the spring of 1943, initially for service with the Ninth Air Force.

Crucially, that same year in an important revision, the Allison V-1710 was replaced by a license-built Packard Merlin engine adapted from the two-stage British Merlin 61. In Britain, serendipity played its hand. On April 30, 1942, following a request from the commanding officer of the Air Fighting Development Unit, Rolls-Royce factory pilot Ronald W. Harker had made a brief flight in an RAF Mustang I at Duxford, in Cambridgeshire, and was instantly impressed. He enthusiastically noted that it was 35mph faster than the Spitfire VB at similar power settings, and with double the range. When questioned after the flight on how the fighter could be made even better, Harker opined that the only natural improvement he would recommend was the installation of a Merlin 61 engine.

Rolls-Royce moved quickly, and with the active endorsement of Maj Thomas Hitchcock Jr., the USAAF's air attaché in London, word soon reached North American Aviation that the British were planning to fit Merlins into Mustangs. It transpired that simultaneous to Hitchcock's initiative, plans were in place for the Packard Motor Car Company of Detroit, Michigan, to manufacture Merlins under license.

After some adaptation of the engine, the first XP-51B was flown by North American Aviation chief engineering test pilot Bob Chilton on November 20, 1942. The Americans were very impressed with the significant improvement in performance that

P-51D MUSTANG

resulted from the marriage of the Mustang airframe and the Merlin engine. Potentially, this gave the USAAF a fighter which could capably tackle the Luftwaffe's Fw 190A and uprated Bf 109G.

When the Packard Merlin was fitted into the Mustang to produce the ensuing P-51B, which first flew on May 5, 1943, the Americans had a fighter with an impressive top speed and rate of climb, together with a range capability that would allow the Mustang to fly 300 miles from its base and back. Such performance numbers meant that the P-51B more than adequately fulfilled VIII Fighter Command's need for a long-range escort fighter. Furthermore, the B-model Mustang was not as "thirsty" as the P-38 Lightning or P-47 Thunderbolt, its rate of consumption being around half of those fighters.

By late 1943, the hope was that a further 85 gallons of fuel could be accommodated in a new tank in the fuselage behind the pilot, increasing the P-51's radius of action to 475 miles. Early examples among the first 253 P-51Bs shipped to Britain had to be converted at the USAAF's Base Air Depot No. 2 at Warton in December, but the aircraft following this batch on the production line already had the tank pre-installed. This would be further extended by the addition of a 108-gallon centrally-mounted drop tank, as well as 75-gallon external tanks carried under each wing. So fitted, the P-51B could boast an unprecedented "reach" of 650 miles. This feat of engineering was attributable to an air pressure system devised by the Air Technical Section that could draw fuel from the auxiliary tanks at high altitude.

The problem as already mentioned, for the Eighth Air Force at least, was that initial deliveries of the P-51B went to the Ninth Air Force for tactical employment in support of troops on the ground. Fortuitously, however, the urgent need for a nimble, long-range escort fighter meant that the Eighth was given temporary control of the 354th FG from the Ninth upon the group's arrival in Britain in October–November 1943.

Unfortunately, "bugs" plagued the service introduction of the P-51 in the ETO, such as problems related to the fitment of the empennage, poorly tightened and overlong attachment bolts and spark plugs that were prone to fouling. This situation was exacerbated by the fact that the new fuselage fuel housing and the drop tank fittings and pump systems were installed in December, when the weather restricted the scope and number of the first long-range missions. Furthermore, the introduction of the 85-gallon fuselage tank meant that the aircraft became tail-heavy, which adversely affected handling.

VIII Fighter Command's planners decided, logically, to retain the P-47 groups with their operationally experienced pilots for escort where enemy fighter reaction was expected to be at its most intense, while the furthest legs of a given mission would be assigned to the P-38 and P-51 groups whose aircraft had the range. After an unremarkable start in December, the Mustangs proved their worth as long-range escort fighters in January during bombing missions to German aircraft plants. On the 5th, for example, the 354th FG claimed 18 victories for no losses and on the 11th its pilots recorded another 15 kills.

On the down side, the Mustang's four wing-mounted 0.50in. Browning M-2 machine guns were found to be susceptible to failure (especially jamming) in the air – something that, strangely, was found not to be the case during firing tests on the

OPPOSITE

P-51D-10 44-14734 6N-K *Baby Mine* was assigned to 1Lt Stephen C. Ananian of the 505th FS/339th FG at Fowlmere in 1944–45. He was at the aircraft's controls when he shot down an Me 262 of I./KG(J) 54 near Fulda on February 9, 1945. It is finished with the standard 339th FG red/white checkerboard nose ring and striped spinner. The fighter was originally assigned to 1Lt Jack S. Daniell, who flew it as *Sweet n Low Down* – this titling appeared on the left cowl. On reassignment to Ananian, the name was changed to *Baby Mine*, apparently inspired by a song from the film *Dumbo*. It was applied to both sides. 44-14734 was written off in a crash on March 28, 1945, its pilot, 2Lt William R. Guyton, surviving the accident unscathed.

ground. Subsequently, it was discovered that the connecting links in the ammunition belts would buckle during the fast turns and violent maneuvers associated with aerial combat, and a solution took several weeks to be found. But this was not all. More "bugs" manifested themselves in the gun actuating mechanisms as a result of oil coagulation at altitude.

Low temperatures at such rarefied heights also caused the insides of the canopy windows and windscreen to cake with frost to the point where pilots were being forced to scrape away ice while in flight. Other snags hampered the operability of fuel systems and radio sets, while the Packard Merlins suffered from coolant leaks that in turn caused overheating. The engines also continued to run roughly because of faulty spark plugs.

Despite these issues, and the prospect of having to fly an escort mission lasting some six to seven hours into skies teeming with enemy fighters and flak, there was a sense among pilots that they had something special in the Mustang. They duly placed their faith in the designers and engineers at North American Aviation to come up with solutions and/or to introduce modifications and refinements. In this, they were not let down.

On January 1, 1944, the nine-victory fighter ace Lt Col Don Blakeslee was appointed commander of the 4th FG at Debden, in Essex. Having flown and led Mustang missions with both the 354th and 357th FGs, Blakeslee was a convinced Mustang convert, and his simple mantra was "It's the ship." Blakeslee's faith was vindicated by the fact that P-51B pilots had claimed 156 enemy aircraft destroyed by the end of the fighter's first full month in combat.

On February 22, a P-51B arrived at Debden to introduce the 4th FG to the aircraft, and for a period of five days pilots from the group – many of whom had flown the Spitfire and were thus accustomed to the behavior of the Merlin engine – took turns to fly it. By the time more examples arrived for the 4th, the pilots had an average of just 40 minutes' flying time on the P-51. Nevertheless, such was the clamor for the aircraft as an escort that the group was quickly sent into enemy airspace.

Despite persisting mechanical and technical problems, P-51 units had claimed more than 200 enemy aircraft destroyed by the end of February. With the start of the new month, the 4th FG claimed two more shot down on March 2. But two days later, the newly-equipped 363rd FG lost 11 of 33 Mustangs it sortied due to poor weather conditions over the Dutch coast, while the historian of the 4th FG felt that his group's claims of three victories that day would have been higher had it not been for "considerable mechanical difficulties with the guns, glycol etc."

Then, on the 6th, Mustangs made it as far as the outskirts of Berlin – a remarkable achievement, and immensely heartening for the bomber crews. During the course of this mission 1Lt Pierce W. McKennon of the 4th FG achieved ace status when he shot down a Bf 109 near the German capital. Although a small event in itself, the ramifications for the Luftwaffe were enormous. Despite the shocking impact the debacle of March 4 had on the 363rd FG, with the unmatchable resources of America's manpower and industrial output, McKennon's victory in a P-51 – an aircraft that just added to the swelling ranks of P-47s and P-38s – was a signal that the tide of US air power would prove overwhelming, far-reaching and unstoppable.

Me 262

Since the late 1930s, pioneering German aircraft designers and engineers had been at work developing an innovative new aerial propulsion technology in the form of the turbojet engine. It had been the Heinkel company which had first got an aircraft powered by a jet engine into the air when the He 178 V1 undertook its maiden flight on August 27, 1939 fitted with a 1,100lb-thrust HeS 3b engine designed by Hans von Ohain. In February of the following year, Ernst Heinkel's contemporary, Professor Willy Messerschmitt, had enhanced the design of his P 1065 – a project that had been intended to fulfill a specification issued by the RLM dating from January 1939 that called for a high-speed interceptor capable of a maximum speed of 560mph to be powered by a single, unspecified jet engine.

Initially, the P 1065 featured a wing virtually identical in planform to the Bf 109 fighter. It was to be powered by two BMW P 3304 turbojets that had been developed by Bramo and were to be mounted centrally in the wings. Unfortunately, however, the planned engines remained unavailable due to problems with their development. In February 1940, the P 1065 was modified to have its outer wing sections swept back some 18 degrees in order to solve problems that heavier engine weight estimates caused on the positioning of the aircraft's center of gravity. Furthermore, it was believed, correctly, that swept wings would reduce the component of airspeed perpendicular to the leading edge, avoiding sharp rises in turbulence and drag.

In order to get the prototype P 1065 flying as quickly as possible, it was proposed to fit it with a single 700hp Junkers Jumo 210G piston engine in the nose using a similar installation to that found in the Bf 109D. Then, as soon as they became available, two BMW P 3302 engines were to be mounted under the wings.

Messerschmitt test pilot Fritz Wendel climbs from the cockpit of Me 262 V3 Wk-Nr 262 000 0003 PC+UC at Leipheim, having just completed a test flight in the spring of 1943. This prototype lacked a nosewheel or armament. A ground technician fills the fuel tank just forward of the cockpit, and protective grills have been placed over the Jumo 004A-0 turbine intakes. The V3 had first flown on July 18, 1942, and was damaged in an accident on August 11. It was repaired and returned to flight-testing in March 1943. (EN Archive)

After wind tunnel-testing had shown that sweeping the wing back improved the aircraft's limiting Mach number, a proposal was issued on April 4, 1941 to develop a 35-degree swept-back wing with an area of 215sq ft and a span of almost 33ft. Construction of the first P 1065 prototype took place between February and March 1941, the project receiving the official RLM designation "Me 262" on April 8. A few days previously, on March 30, Heinkel's new jet fighter, the He 280, had made its first flight powered by two 1,654lb-thrust HeS 8A turbojets.

Messerschmitt's state-of-the-art fighter took to the air using pure jet power on July 18, 1942, when company test pilot Fritz Wendel made a trouble-free flight from Leipheim in the V3 third prototype. The aircraft was fitted with a pair of Junkers Jumo 004A-0 (T1) engines. The latter had been developed in December 1939, the prototype making its first test run on October 11, 1940. In December of that year the engine was run at its full design speed of 9,000rpm, and by the end of January 1941 a thrust of 948lb was reached. However, numerous problems were experienced, and it was not until August 6, 1941 that the design thrust of 1,323lb was achieved. The first flight of the T1 suspended from a Bf 110 test aircraft took place on March 15, 1942.

Despite the delayed gestation of both aircraft and powerplant, Wendel was able to report generally smooth handling of the Me 262 during its maiden test flight, during which he achieved an unprecedented airspeed of 447mph. Regardless of any misgivings he may have harbored, Wendel also recorded that the Junkers T1 engines "worked well."

Germany now possessed the technology it needed to respond to the ever-growing threat of Allied air power in the West. From then on, until mid-1944, development on the Me 262 forged ahead using a series of prototypes to test all aspects of the aircraft. Low points were encountered when some of the early prototypes crashed and two test pilots were killed. Nevertheless, the new jet interceptor had been championed by a small number of leading Luftwaffe fighter aces, including Hauptmann Wolfgang Späte (see Introduction). The commander of the Luftwaffe's fighter forces, Generalmajor Adolf Galland, was also greatly enthused by the aircraft when he flew the Me 262 V4 in May 1943 at Lechfeld (after an attempt to start the engines of the V3 resulted in a fire), and he made his famous report to *Reichsmarschall* Hermann Göring in which he proclaimed, "It felt as if angels were pushing!"

As far as performance was concerned, even in its prototype variants, the Me 262 was, indeed, a formidable and ground-breaking aircraft. As early as October 1943, the Me 262 V3 was achieving test speeds of 590mph, whilst eight months later the Me 262 S2 reached 624mph in a dive. In terms of offensive load, it was planned to install one 30mm MK 103 cannon and two 20mm MG 151/20 cannon in the nose.

Galland became a firm advocate for the further development of the jet, and wrote to his superiors that all measures should be taken to ensure swift and large-scale production of the aircraft. In a report to Generalfeldmarschall Erhard Milch, he wrote:

> The aircraft represents a great step forward and could be our greatest chance; it could guarantee us an unimaginable lead over the enemy if he adheres to the piston engine. The flying qualities of the airframe make a very good impression. The engines are extremely

OPPOSITE

Major Theodor Weissenberger flew Me 262A-1 "Green 4" from Brandenburg-Briest while serving as *Kommodore* of JG 7 – a position he held from November 1944 until war's end. He may have been flying this aircraft when he claimed a P-51 shot down northwest of Eberswalde on March 16, 1945 for his first victory in the Me 262 – Weissenberger's victim was possibly an F-6C of the 10th Photo-Reconnaissance Group. The aircraft carries one of several variations of the running fox emblem of JG 7 on its nose, with a *Stab* green tactical number "4" immediately beneath it. The aircraft was probably finished in a roughly applied overall coat of RLM 83 with RLM 76 or 77 undersurfaces, breaking up to some degree on the tail assembly. The Me 262 is also marked with extended horizontal bars in black, outlined in white, denoting its assignment to the *Kommodore*, as well as JG 7's blue and red Reich air defense fuselage identification band.

Me 262A-1

On April 17, 1943, Me 262 V2 Wk-Nr 262 000 0002 PC+UB, distinctive here through the absence of the aircraft's familiar nosewheel, was assessed in flight by 72-victory Knight's Cross-holder and former *Staffelkapitän* of 5./JG 54, Major Wolfgang Späte. He subsequently reported that, in his view, with its combination of high performance and heavy armament, the Me 262 would be able to prove efficient against both enemy fighters and bombers. However, the following day, the same machine nose-dived and crashed, killing test pilot Oberfeldwebel Wilhelm Ostertag, following an engine flame-out. (EN Archive)

convincing, except during take-off and landing. The aircraft opens completely new tactical possibilities.

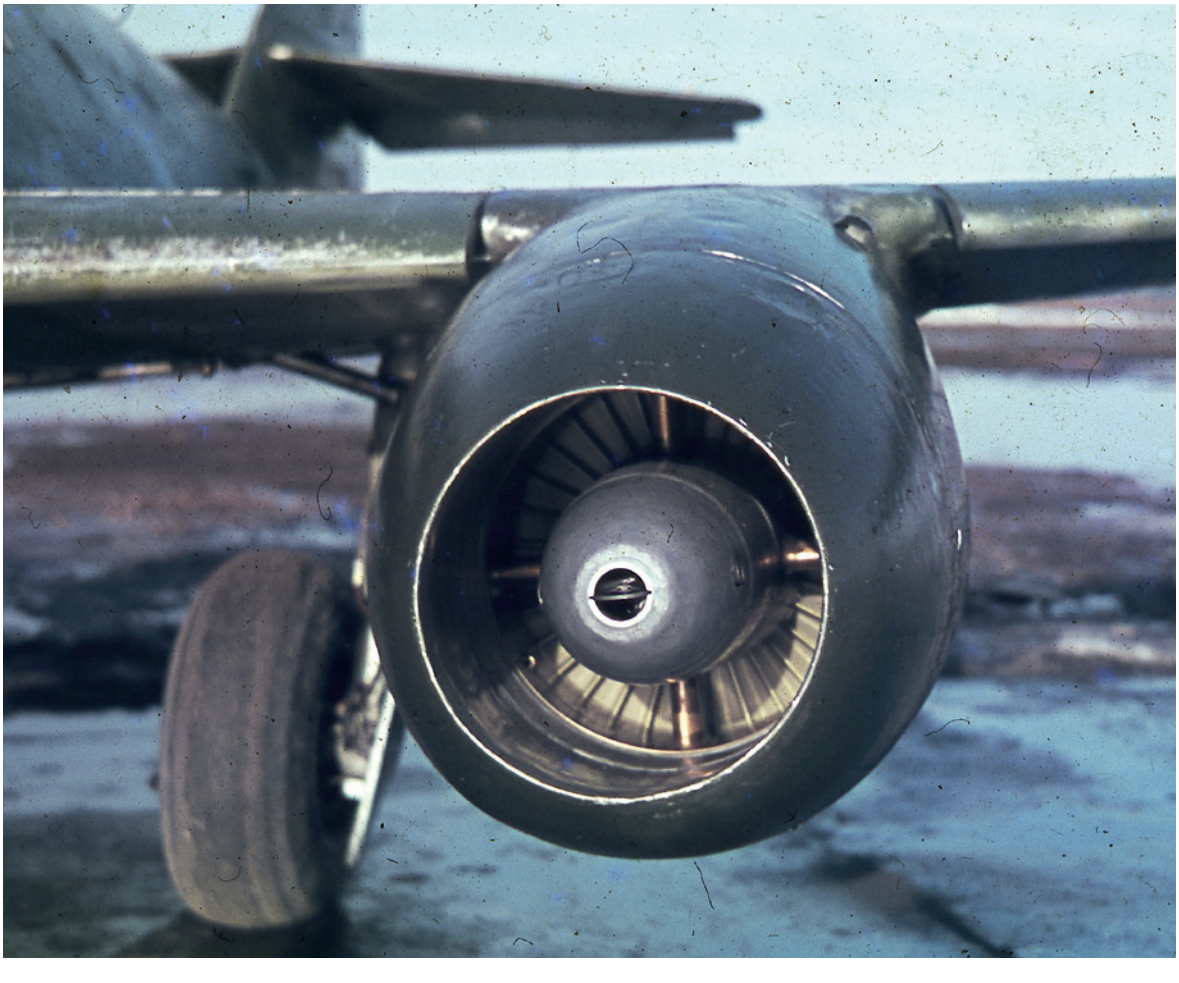
Galland also advocated the immediate cancellation of the piston-engined Me 209, the intended replacement for the Bf 109, so as to allow production of at least 100 Me 262s by the end of 1943. His enthusiasm expressed to Milch may have been a little premature, for shortly afterwards, the director of testing at Messerschmitt, Dipl.-Ing. Gerhard Caroli, offered his own, more realistic appraisal of the Me 262. He warned, amongst other things, of problematical ailerons, high forces on the elevators and rudders, inadequate directional stability, poor stall behavior, and insufficient fuel injection. Yet despite Professor Messerschmitt's misgivings over the cancelation of the Me 209, Galland won Milch's support and immediate priority was given to an initial Me 262 building program.

This was to be plagued from the start. Firstly, production of the Me 209 was reinstated as a result of Messerschmitt complaining directly to Hitler, and thus emphasis diverted from the Me 262 project. Secondly, a USAAF air raid on the Regensburg assembly plant in August 1943 destroyed crucial fuselage jigs and acceptance gauges and forced the company to relocate its project office from Augsburg to Oberammergau, in the Bavarian Alps. And thirdly, the promise of 1,800 skilled workers needed to tool-up two production lines proved fickle and they arrived late, resulting in the loss of almost three million man hours in nine months.

On November 2, 1943, Göring, accompanied by Milch, visited the bomb-damaged Regensburg works and met Messerschmitt. It was at this meeting that a new, previously unforeseen dimension crept in – the demands of Hitler. Göring enquired of Messerschmitt as to whether the Me 262 could carry bombs externally. "Herr *Reichsmarschall*," Messerschmitt replied, "It was intended from the beginning that the machine could be fitted with two bomb racks so that it could drop bombs, either one 500kg or two 250kg. But it can also carry one 1,000kg or two 500kg bombs." Göring was elated: "That answers the *Führer*'s question."

Three days later, however, Göring and Milch were at Dessau, where they met Dr. Anselm Franz of the Junkers engine company. Bombs or no bombs, an aircraft cannot fly without engines. The design of the Me 262 incorporated a pair of Jumo 004 turbojet engines mounted beneath the wings, each unit comprising an eight-stage axial flow compressor, six separate combustion chambers and a single-stage turbine. The first production engines were delivered in May 1943, having been improved by modifications to the compressor and the turbine entry nozzles which increased static thrust from 1,852lb-thrust to 1,985lb-thrust.

However, two months later in July, it was noticed that there were still "inconsistencies" in engine performance, with the engines on the V3 and V4 prototypes suffering from burning after shutdown. The summer was dogged by flame-outs and leaking and igniting fuel and Franz warned Göring and Milch of difficulties still being experienced with individual components, including the turbine wheel which suffered from vibration and the control system where there was difficulty in opening and closing the throttles. "It cannot be guaranteed with certainty," Franz admitted. "That we will have the problem at upper altitudes rectified by the time series production begins so that the pilot will be able to open and close the throttles without worrying about a flame-out."



The forward end of a Jumo 004B turbojet unit showing the intake cone, in the center of which can be seen the pull-ring for the Riedel two-stroke starter motor. Also just visible on the access panel is a small handle for the motor's fuel filler point. (EN Archive)

Göring seems to have been unworried by this, for on November 26 he invited Hitler to Insterburg, in East Prussia, so that he could view a display of some of the Luftwaffe's latest aircraft and weaponry. Examples of the Me 163 rocket fighter were shown, as were new versions of the Ju 88 and the Arado 234 jet bomber, the V1 flying bomb and new, air-launched guided missiles. After a bungled commentary on the proceedings by Göring, the Me 262 V6 streaked past flown by Flugkapitän Gerd Lindner. Hitler was impressed. He asked whether the aircraft was able to carry bombs. Messerschmitt, also in attendance, eagerly stepped forward and again reiterated that the jet could carry a bomb-load of 1,000kg. Shortly afterwards, Göring duly ordered the necessary trials to commence.

That Hitler asked if the Me 262 was able to carry bombs may have been a misguided question from a man who had little knowledge of air strategy and aircraft design, but, at the same time, it was perfectly understandable, since every other frontline Luftwaffe combat aircraft had already proved itself adequately capable of carrying bombs or performing in the fighter-bomber role. What was different about the Me 262? Yet, six months later, in May 1944, on the Obersalzberg, Hitler had discovered from Milch that contrary to his orders that the Me 262 be produced as exclusively as a fighter-*bomber*, the aircraft was, in fact, being built purely as a fighter. Hitler was exasperated and flew into a rage. Milch tried to reason, "*Führer*, even the smallest child can see that this is a fighter and not a bomber."

Assisted by contacts in the RLM, the *Jägerstab* (a committee comprised of industrialists and representatives of the RLM that had been set up in February 1944 with the task of regenerating the Reich's flagging and bomb-stricken fighter production) and the armaments ministry, Galland managed to hold on to some degree of influence over the development program. This duly allowed him to steer the Me 262 towards deployment as a fighter. The aircraft eventually emerged as a twin-engined jet interceptor powered by two Jumo 004 turbojet units. In A-1a fighter configuration, it was to be armed with four 30mm MK 108 cannon mounted in the nose.

Generalleutnant Adolf Galland (right), commander of Me 262-equipped JV 44, with customary cigar clenched between his teeth, and Oberst Günther Lützow, one of his senior officers, wait at readiness at Munich-Riem in April 1945. Galland never wavered from his efforts to convince the Luftwaffe leadership that the Me 262 was the interceptor that the fighter units so badly needed to combat the Allied bomber offensive. In reality, he would not get his chance until the formation of JV 44 in February 1945. (Author's collection)

It now remained to be seen whether the aircraft would live up to expectations, and whether Galland's faith and optimism would be proved justified. For that, as Allied bombs began to rain down in ever greater numbers on the aircraft production plants and transport infrastructure, he would need an efficient supply chain, adequate numbers of aircraft, sufficient stocks of fuel and ammunition, and adequately trained pilots.

TECHNICAL SPECIFICATIONS

P-51D/K MUSTANG

From their introduction into the skies over northwest Europe in late 1943, the all-metal, low-wing Packard Merlin-powered main production P-51B models equipped Mustang squadrons of the Eighth and Ninth Air Forces well into the summer of May 1944 – indeed, a handful of examples remained in frontline service through to year-end. The appearance of the aircraft in significant numbers must have sent a shiver of concern down the spines of Luftwaffe fighter pilots, and by March 1944 the four Mustang fighter groups in England were being credited with a "kill" rate of 13 enemy aircraft destroyed per 100 sorties – a figure that easily exceeded those for the P-38 and P-47 squadrons of four and three, respectively. There was almost universal agreement among senior USAAF commanders that as many fighter squadrons as possible, if not all, should be equipped with P-51s.

Still, there was some reticence. Col Hubert Zemke, commander of the 56th FG, was particularly reluctant to part with his big, solid P-47s, and there was also resistance from the P-38-equipped 364th and 479th FGs. One of the main issues for concern was the P-51B's persistent gun-jamming and freezing problems, with even the redesigned feed to the two 0.50in. guns in each wing proving troublesome. Personnel of the Ninth Air Force's 354th FG at Boxted, in Essex, resorted to the somewhat successful expedient of incorporating the electric ammunition booster used on B-26

P-51D-10 44-14214 was one of the first 2,500 full-scale production D-models with the new high-visibility bubble canopy and six-gun wings. It was also part of the largest single order of Mustangs when North American Aviation was contracted by the War Department in April 1943. Photographed above California during a post-production check flight, the aircraft was subsequently shipped to Britain and issued to the 358th FS/355th FG at Steeple Morden, in Cambridgeshire. (San Diego Air & Space Museum)

Marauder bombers, but even this solution never totally overcame freezing at altitude and the jamming of spent links in the ejection chutes.

Furthermore, vision aft from the "razorback" cockpit was not good, with pilots complaining of a blind spot to the rear which had to be countered by the inclusion of mirrors. The RAF had replaced the original, three-section, hinged, American, "greenhouse" canopies in its Mustang IIIs (P-51B/Cs) with a bulged, sliding design free of framework, known as the Malcolm Hood after its designer, Sqn Ldr Robert Malcolm. First tested at Boscombe Down, in Wiltshire, this offered a great improvement in all-round vision, including on the ground, where the high angle of the nose made maneuvering quite difficult. The USAAF decided to adopt a similar design with some urgency, although only a small number of P-51Bs received the new hood.

A P-51C model, built by the North American Aviation plant in Dallas, Texas, bolstered the Inglewood-built P-51B force in England from February 1944, differing from the B-model only in the incorporation of some detail changes.

Yet despite the British introduction of the Malcolm Hood, back in the US, North American Aviation engineers had already been at work for some considerable time devising an unobstructed-vision canopy made of the still relatively new material known as Plexiglas, which was also used in the nose glazing of USAAF bombers. The challenge was to come up with a rounded or "bubble" canopy strong enough to resist the temperatures and stress of high-speed maneuvers at high altitude.

In addition to wind tunnel testing with a laminated wooden model, to trial this new design, the tenth production P-51B-1 was reworked from the windshield aft to the tail to allow the fitment of the bubble canopy. Flight tests proved very successful and on February 27, 1943 the 201st and 202nd P-51B-1s became the first manufacturing "prototypes" for a new Mustang that no longer had its razorback

fuselage, but rather a lower, sleeker profile design crowned by the new all-round vision canopy. While this canopy was of undoubted tactical advantage, it did bring an increase in directional instability, particularly when, as a result, a novice or careless pilot found the aircraft adopting its tendency to veer off a runway to the right. The "prototype" P-51D was first flown at Mines Field on November 17, 1943 with Bob Chilton at the controls. This flight, and ensuing flights, went well.

Designated as the P-51D, the aircraft was 32ft 3in. in length with a span of 37ft and weighed 7,126lb empty. This model was to be powered by a V-1650-7 Packard Merlin engine rated at 1,300hp, driving a four-bladed, hydromatic, solid aluminum, constant-speed 11ft 2in. Hamilton Standard propeller. It had a maximum speed of 437mph at 25,000ft in level attitude flight, with a tactical cruising speed of between 210–320mph and could climb to 30,000ft in 13 minutes. Range on internal fuel was 700 miles.

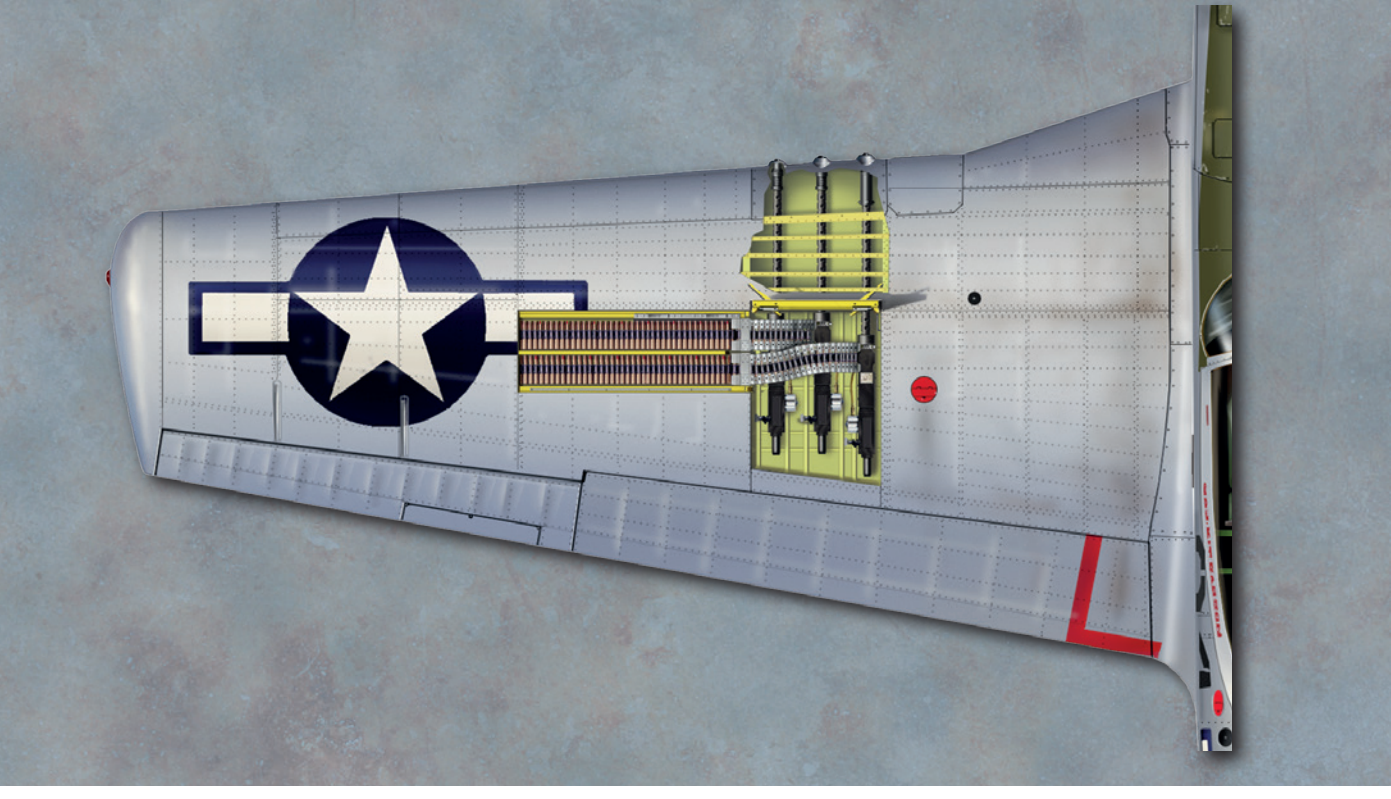
The cockpit could be heated and ventilated, the former from warm air fed from a large, water-cooling air scoop just behind the radiator, the latter via a small scoop located between the fuselage and the big air scoop. The pilot's seat was adjustable vertically (no forward or aft adjustment was possible) and was designed to accommodate a seat or back-pack parachute, while the back cushion was kapok-filled and could be used as a life-preserver.

The instrument panel was organized such that flight instruments were grouped at the center and to the left, while engine instruments were located to the right. The

Armorers feed a belt of ammunition into the rear magazine for the 0.50in. Browning M2 machine guns installed in the right wing of a P-51D from the 504th FS/339th FG, based at Fowlmere, in Cambridgeshire. Capt Nile C. Greer of the 504th FS claimed the destruction of an Me 262 on March 21, 1945, followed by a share in a second exactly two weeks later. On the latter occasion, his victim is believed to have been Major Rudolf Sinner, the *Kommandeur* of III./JG 7, who was flying his 305th mission. Sinner is credited with 39 victories, including an unconfirmed P-51 shot down while flying the Me 262 on March 7, 1945. (NARA)

P-51D MUSTANG WING GUNS

The P-51D was fitted with six 0.50in. Browning M2 machine guns, three weapons in each wing. The guns were charged manually on the ground and fired simultaneously when the trigger switch on the control column grip was pressed. The maximum ammunition capacity for each of the inboard guns was 400 rounds, with 270 for the center and outboard guns. The weapons were adjustable on the ground and could be harmonized to different patterns for various tactical situations. They were usually aligned to converge at a range of 250–300 yards.



hydraulic pressure gauge was below the pilot's switch pane and the fuel indicators were on the floor and at the rear of the cockpit. Radio equipment comprised a VHF transmitter and receiver, a Detrola low-frequency receiver, an AN/APS-13 lightweight rear warning set, and an IFF unit, all of which was installed in the fuselage aft of the cockpit. The controls for this equipment were found to the right of the seat.

In addition to the new canopy, which was manufactured from "Lucite" methyl methacrylate resin by Du Pont, and improved seating, another operational bonus of the P-51D lay in its increased fuel capacity – the internal load of 269 gallons was increased to 489 gallons by the fitment of two 110-gallon wing-mounted drop tanks. If handled well, the new Merlin could consume less than 60 gallons per hour while cruising at 260mph when flying escort missions. During flight, a pilot would drop the external tanks using the bomb release system, but before doing so he had to select an internal tank. If he failed to do that, the engine would quickly falter due to a lack of fuel. Pilots would have to fly straight and level when external tanks were fitted so as not to inflict any g forces on them.

As a progression from the B/C-models, which had a two-stage operation, the P-51D featured a single-stage, hydraulically sequenced undercarriage extension, with the up-locks releasing automatically. However, it was discovered quite early on in its

service career that if the selector lever was left in neutral, high-speed airflow could force the doors open and push the gear out and down, thus placing stress on the wing. Pilots were therefore reminded to keep the selector in the "up" position.

A vulnerable part of the P-51B/C that persisted with the D-model Mustang was the cooling system. A single round fired from an enemy aircraft or from the ground into the radiator cores could, potentially, start a leak leading to overheating. This vulnerability was thought to be solved by the introduction of a quarter-inch-thick metal plate for the radiator scoop, but weighing in at 105lb, this idea was abandoned.

Overheating was also caused by poorly functioning radiator shutters. The shutter located at the rear of the radiator scoop worked automatically to regulate temperature, and if it failed, manual, electric control could be effected from the cockpit. However, in damper conditions during fall, with the atmosphere colder, it was found that the whole system could fail. Therefore, it was recommended that the shutters be removed entirely to prevent overheating in case of failure.

The P-51D also included two more 0.50in. Browning M2 weapons, raising total armament to six wing-mounted guns and an increase in ammunition of 620 rounds compared to the B/C-models, giving a total of 1,880 rounds loaded in as 400 rounds for each inboard weapon and 270 for the center and outboard guns. Each gun weighed 64lb, had a muzzle velocity of 2,180ft per second, and a theoretical range of 7,200 yards, although in air combat the effective range was closer to 800 yards maximum. The guns had been remounted to allow easier access and to eliminate the problems that plagued the B- and C-models. When the P-51D entered service, pilots noted a significant improvement in gun reliability.

Gunsights were either of a ring-and-bead type fitted on mounts on the engine formers or, up to September 1944, of the N-9 optical sight type, after which the K-14B gyro-computing sight – an American version of the British Mk IID gyro sight – was installed by servicing groups. After inputting the wingspan of the enemy aircraft under pursuit, the pilot would then feed in the target's range by turning a handgrip on the throttle lever. This sight also aided extremely accurate deflection shooting.

The P-51D could also be fitted with bomb racks able to carry 1,000lb bombs, although 500lb ordnance was, ordinarily, the heaviest carried in the ETO in place of drop tanks. Individual release came as a standard function in the P-51D.

The first production order for the D-model was placed on April 13, 1943 for 2,500 machines, and ten days later a further order for 100 aircraft was placed by Australia. P-51Ds began arriving in Britain in March 1944, gradually replacing P-51B/Cs, and during the second half of that year, in sequence, the 20th, 55th, 353rd, 356th, 479th, and 78th FGs all received examples as replacements for the P-47 and P-38.

On May 3, 1943, another contract was awarded to North American Aviation's Dallas plant for 2,500 P-51s, of which 800 were to be D-models, 1,500 the new K-model, and the balance being P-51Cs. Essentially the same as the D-model in terms of build, general specification, and armament, the K-model was fitted with an 11ft A-5A-2A-1 type propeller manufactured by Aeroproducts, as Hamilton Standard production was at full stretch for various different types of aircraft – the "K" suffix merely reflected this difference. The Aeroproducts blades were steel and hollow, and the variant suffered from blade imbalance to the extent that by September 1944 the rejection rate for vibration neared 19 percent. Examples of the K-model eventually

The shark-like fuselage and the adjustable *"Zwiebel"* (onion) orifice cones of the Jumo 004B turbojets fitted to the Me 262A-1a are seen to advantage in this photograph of Wk-Nr 111745 "White 5" of JV 44 at Munich-Riem in the spring of 1945. This aircraft is known to have been flown by several of the unit's pilots, most of whom were former piston-engined NCO instructors that had transitioned hastily to flying the jet interceptor. (Author's collection)

began to reach units in the ETO in November 1944. This variant proved to be less popular with pilots than the P-51D because the Aeroproducts propeller was fitted with an unreliable electrical feathering system that was less efficient than the D-model's hydraulic Hamilton Standard unit.

By April 1944, 6,000 P-51Ds had been ordered, and it was used in greater numbers than any other Mustang model. North American Aviation's Inglewood plant turned out 6,502 examples and the Dallas factory 1,600. Of the K-model production, 163 were finished as F-6K photo-reconnaissance variants.

Me 262A-1a

The main day fighter variant of the Messerschmitt Me 262 to see operational service was the A-1a. The first attempt at defining standardization came on May 8, 1943 when Messerschmitt design and development engineers at Augsburg issued *Projektübergabe* ("Project Delivery") *IV*, "*Me 262 Jäger und Jabo,*" which set out the planned production models – the A-1 fighter and the A-2 fighter-bomber. At this time, the Me 262 was still deep in its prototype testing phase, although it had been finalized that the "A" variant was to be an all-metal single-seater with swept-back wings and powered by two turbojet units.

The *Projektübergabe* was followed on October 29, 1943 by *Protokoll* Nr. 19, which described the A-1 in greater detail, confirming that it was to be a single-seat interceptor

powered by a pair of Jumo 004B-1 jet engines. The aircraft was to be armed with four 30mm MK 108 cannon firing a total of 360 rounds, a fuel load of 2,570 liters and appropriate radio equipment for day fighter operations.

Production was authorized, but actually building the Me 262 was another matter. On April 25, 1944 – the day after the Eighth Air Force had bombed the Messerschmitt assembly plant at Leipheim where the jet was being built – the *Jägerstab* met to discuss the latest situation. Milch chaired the meeting. The committee was torn between continuation of the A4 rocket (the V2) or production of a badly needed jet fighter that could introduce a new dimension into the air war in Germany's favor. Dr. Krome, the member responsible for jet aircraft, opined to Milch that it was "a choice between the A4 in a year or the Me 262 in three or four months."

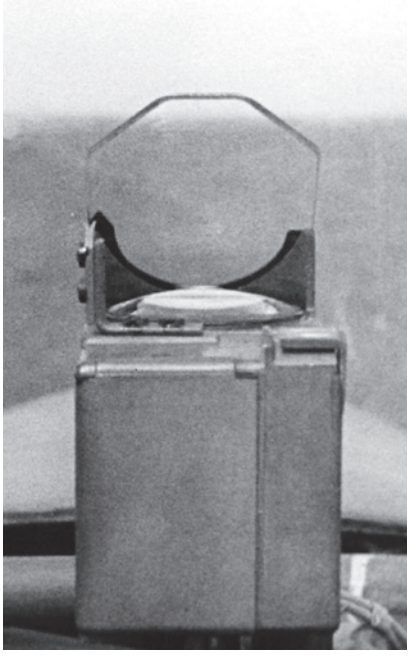
Fearful of the appearance of Allied jet aircraft later that year, Professor Messerschmitt had written to the production director of the Jumo engine plant at Dessau just five days prior to the meeting imploring him to overcome the problems – and thus delays – associated with delivery of the badly needed Jumo 004 engines. "It is a matter of life and death for us all to set up the numbers of Me 262s with your engines as rapidly as possible," wrote Messerschmitt.

It was therefore remarkable, in view of Allied bombing of the transport network, production centers and airfields, and the ensuing production bottlenecks, that the Me 262A-1a – a fighter formed of entirely new concepts in aeronautical design and technology – reached the Luftwaffe within three months of the *Jägerstab* meeting and Messerschmitt's letter.

In its usual form the Me 262A-1a was an elegant, low-wing, all-metal, twin-jet, single-seat interceptor with 18.5-degree swept-back wings bearing a span of 12.56m, a shark-like fuselage 10.6m in length incorporating a nosewheel, and a large, high tail assembly to which were fitted horizontal stabilizers also with swept-back leading edges. The equipped weight, allowing for a pilot, ammunition, and a fuel load of just over 1,800 liters, was 6,074kg. The pilot was accommodated in a self-contained sub-assembly that held the instrument panel and electrical controls, control column and rudder, throttles, seat, and battery. This *"Wanne"* (tub) was designed to break free on impact in the case of a crash-landing, offering the pilot some degree of enclosed protection. The cockpit was capped by an all-round vision, hinged canopy.

The instrument panel held a large number of gauges and dials, but was well laid-out. The key flying gauges such as

Armorers from the Ninth Air Force inspect the installation of the four 30mm MK 108s in the nose of an abandoned Me 262A-1a of JV 44 at Innsbruck-Hötting, in Austria, in May 1945. The Staff Sergeant to the right has removed the top of the one of the cannon's breech mechanisms. Note also the electric ignition cables. (Author's collection)



The Revi (*Reflexvisier*) 16b gunsight was a standard fitting in the Me 262A-1a fighter. Here, it is raised and locked into its combat setting, looking directly through the reflector glass. The sight incorporated a sun visor, night vision filter, light bulb, and dimmer switch. When not in use it could be folded away to the right of the instrument panel. (EN Archive)

the airspeed indicator, altimeter, compass, turn-and-bank indicator, artificial horizon, and rate-of-climb indicator were located on a panel to the left, while engine controls, injection and gas pressure, and temperature indicators were grouped to the right. An arm-level panel to the left of the pilot housed the undercarriage and oxygen controls, with radio and electrics on a similar panel to the right. The Me 262A-1a was provided with a FuG 16ZY transmitter/receiver and a FuG 25a IFF set.

The two Junkers Jumo 004B-1 turbojet engines were each comprised of an eight-stage axial compressor with single-stage turbines producing 1,978lb-thrust at 8,700rpm. The B-series engine saw improvements over the A-series that had been used on the early Me 262 prototypes. These included modified compressor construction using a rotor with separate discs, the replacement of castings with sheet metal where possible, improved entry to the air intake and the substitution of more than half the weight of strategic material used in the A-series engine (although solid turbine blades were still fitted). A Jumo 004 unit was 3.8m long and weighed between 730–750kg. These groundbreaking, state-of-the-art engines gave the Me 262 a climbing speed of 10m/sec at 6,000m (seven minutes) and 5.2m/sec at 9,000m (14 minutes). Maximum range at 6,000m was 520km and 644km at 9,000m.

Standard fuel tankage totaled 2,570 liters of J2 fuel contained in four internal tanks, with provision for two ETC 503 external racks each holding a 300-liter drop tank. J2 was a brown, low-grade, coal oil fuel similar to diesel oil, and was usually available in ready supply in 1944, despite transport problems.

In the standard fighter/interceptor configuration, the Me 262 was armed with four 30mm MK 108 cannon mounted in the nose. Manufactured by Rheinmetall-Borsig, the MK 108 was a blow-back operated, rear-seared, belt-fed cannon that used electric ignition, being charged and triggered by compressed air. The prime benefit of this weapon, used profusely by the Luftwaffe for close-range, anti-bomber work from early 1942 onwards, lay in its simplicity and economic process of manufacture – the greater part of its components consisted of pressed sheet metal stampings.

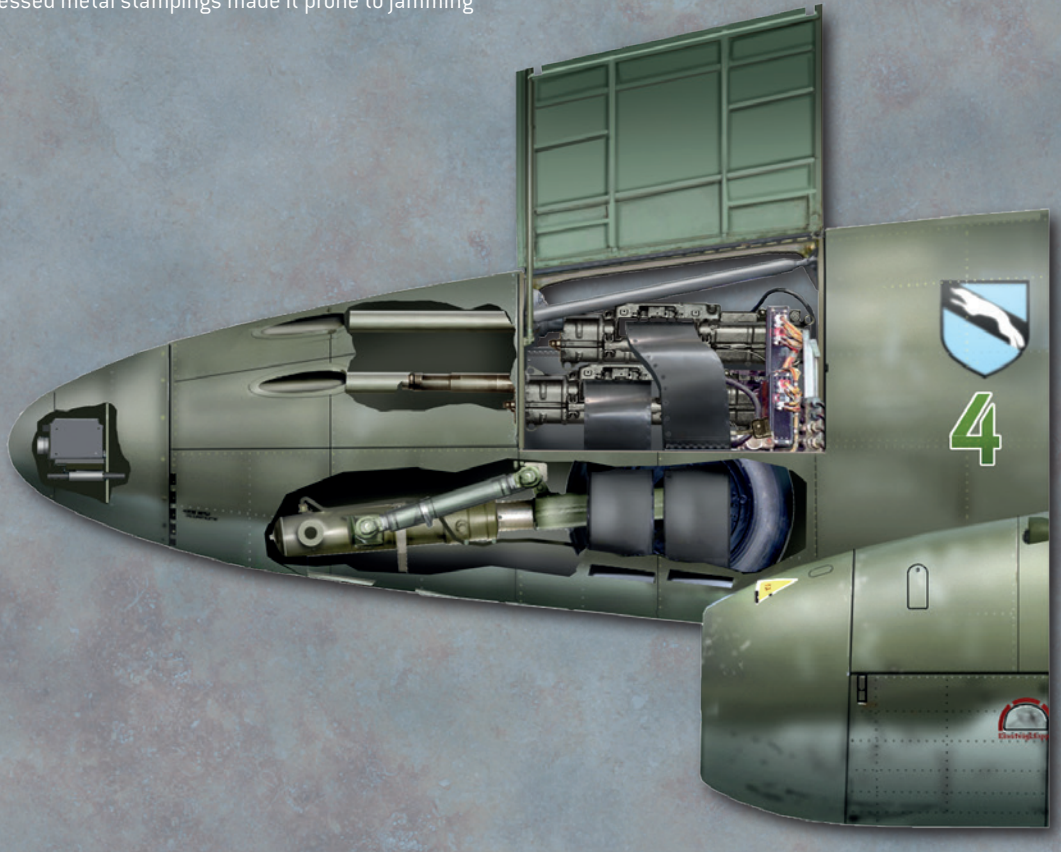
With the advent of massed American daylight bomber formations bristling with concentrated defensive firepower, the need arose for a long-range, heavy-caliber gun with which a German pilot could target specific bombers, expend the least amount of ammunition, score a kill in the shortest possible time, and yet stay beyond the range of the defensive guns. It was a virtually impossible requirement, and yet the MK 108 almost achieved this when used by later variants of the Bf 109 and the Fw 190A-8, where it quickly earned a fearsome reputation amongst Allied bomber crews. Two types of shell could be loaded, namely the 30mm high-explosive tracer type "M" shell designed to cause blast effect and the 30mm high-explosive incendiary shell.

Adolf Galland recalled the gun being installed in the Me 262s of his unit, *Jagdverband* (JV) 44:

> Firstly, it was, constructionally speaking, extraordinarily easy to install four MK 108s into the aircraft. Secondly, it was good to have a gun which solved all our problems – that is

Me 262 MK 108 CANNON

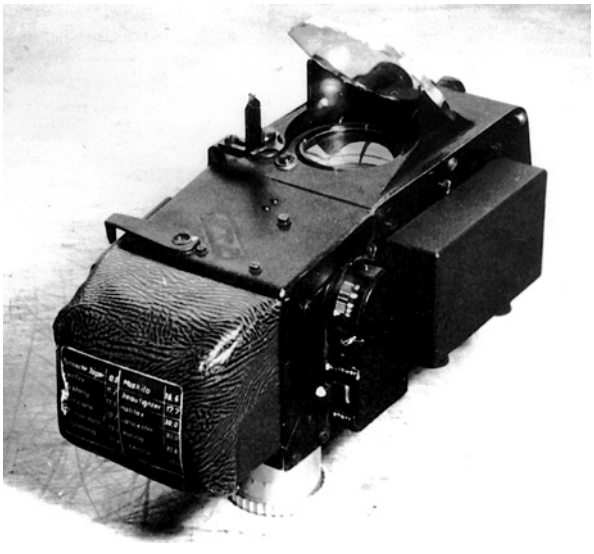
The standard installation of four 30mm belt-fed, electrically-ignited Rheinmetall-Borsig MK 108 cannon in the nose of an Me 262A-1a interceptor of JG 7. When used at close range in the hands of a skilled pilot, the effect of such armament against enemy bombers could be devastating. However, although a powerful weapon, the cheapness of the MK 108 and its ease of manufacture using pressed metal stampings made it prone to jamming and other forms of malfunction. Its slow rate of fire also reduced its effectiveness when used in combat by the high-speed Me 262. Note the proximity of the nosewheel housing to the gun bay, as well as the electric ignition cable at the rear of the cannon installation and the ammunition discharge chutes. A gun camera was also installed in the nose of the aircraft.



to say a gun which had a rapid rate of fire and great destructive effect, although there was the disadvantage of an insufficiently flat trajectory. There were snags – the guns were not that much good when you were banking because the centrifugal forces arising from banking ripped the belts. But these teething troubles were easily sorted out by a well-trained groundcrew.

Initially, it was foreseen that a Revi 16b reflector gunsight would be installed – a tried and tested type used by the Luftwaffe's fighter units for much of the war. It was also planned to fit as many Me 262s as possible with the new EZ 42 gyroscopic gunsight that allowed a pilot to fire at a target without allowance for its movement from fixed guns built into the longitudinal axis of the carrying aircraft. When approaching a target, a pilot had to ensure that he continuously twisted the

OVERLEAF
The EZ 42 gyroscopic gunsight, manufactured by Askania and Carl Zeiss, was intended to be widely fitted into the Luftwaffe's Me 262s in order to improve accuracy in deflection shooting. However, pilots who flew machines with an EZ 42 installed in the cockpit found the equipment problematic. (EN Archive)



range-finding button on the aircraft's control column so that the growing target was permanently encapsulated in the dial, as well as making sure that the cross-wire was contained within the target-circle on the target. The precise angle of deflection was obtained within two seconds. Accuracy could be guaranteed to within 15 percent of the angle of deflection in the longitudinal direction of the enemy and ten percent perpendicularly.

Despite the Me 262 only ever being available in modest numbers, its appearance alone gave those Luftwaffe pilots slated to fly the jet cause for both encouragement and trepidation. Encouragement, because finally they had an aircraft with which they could power past and away from most Allied escort fighters to get to the bombers. And trepidation as a result of having to learn and master an entirely new form of propulsion, capable of unprecedented speed, and to turn the aircraft into an efficient tactical asset. There was also the question of the new P-51D Mustang.

P-51D and Me 262A-1a Comparison Specifications

	P-51D	Me 262A-1a
Powerplant	Packard Merlin V-1650-7	2 x Jumo 004B turbojets
Dimensions		
Span	37ft 0in	41ft 2in
Length	32ft 3in	34ft 7in
Height	13ft 8in	12ft 7in
Wing area	235.75sq ft	233.58sq ft
Weights		
Empty	7,365lb	8,367lb
Maximum	11,600lb	14,271lb
Performance		
Maximum Speed	438mph at 25,000ft	525mph at 29,500ft
Range	500 miles combat range (880 miles combat with 75gal drop tanks/1,830 miles ferry)	440+ miles at 29,500ft
Rate of Climb	3,475ft per minute	3,900ft per minute
Ceiling	41,900ft	38,714ft
Armament	6 x 0.50in. Browning M-2 machine guns (three per wing); 1,000lb of bombs under wings	4 x 30mm nose-mounted Rheinmetall-Borsig MK 108 cannon; 24 x 55mm R4M underwing rockets

THE STRATEGIC SITUATION

In a poignant moment in January 1944, the newly appointed commander of the Eighth Air Force, Maj Gen James H. Doolittle, walked into the office of Maj Gen William E. Kepner, commander of VIII Fighter Command, and read a sign hanging from the wall:

> The first duty of the Eighth Air Force fighters is to bring the bombers back alive.

Doolittle ordered Kepner to remove the sign, and he arranged a replacement which read:

> The first duty of the Eighth Air Force fighters is to destroy German fighters.

Doolittle's doctrine was, to a great extent, adopted, but not fully. It is true that from early 1944, concurrent with the strategic *Argument* offensive directed against German fighter strength and production, USAAF fighters began to roam offensively over northwest Europe, albeit mainly when they could be released from their bomber charges to attack and strafe German airfields and transport targets on their way home to their English bases. But such an opportunity had to be shared with the equally important task of escorting the bombers on longer-range missions as their targets reached ever deeper into the Third Reich.

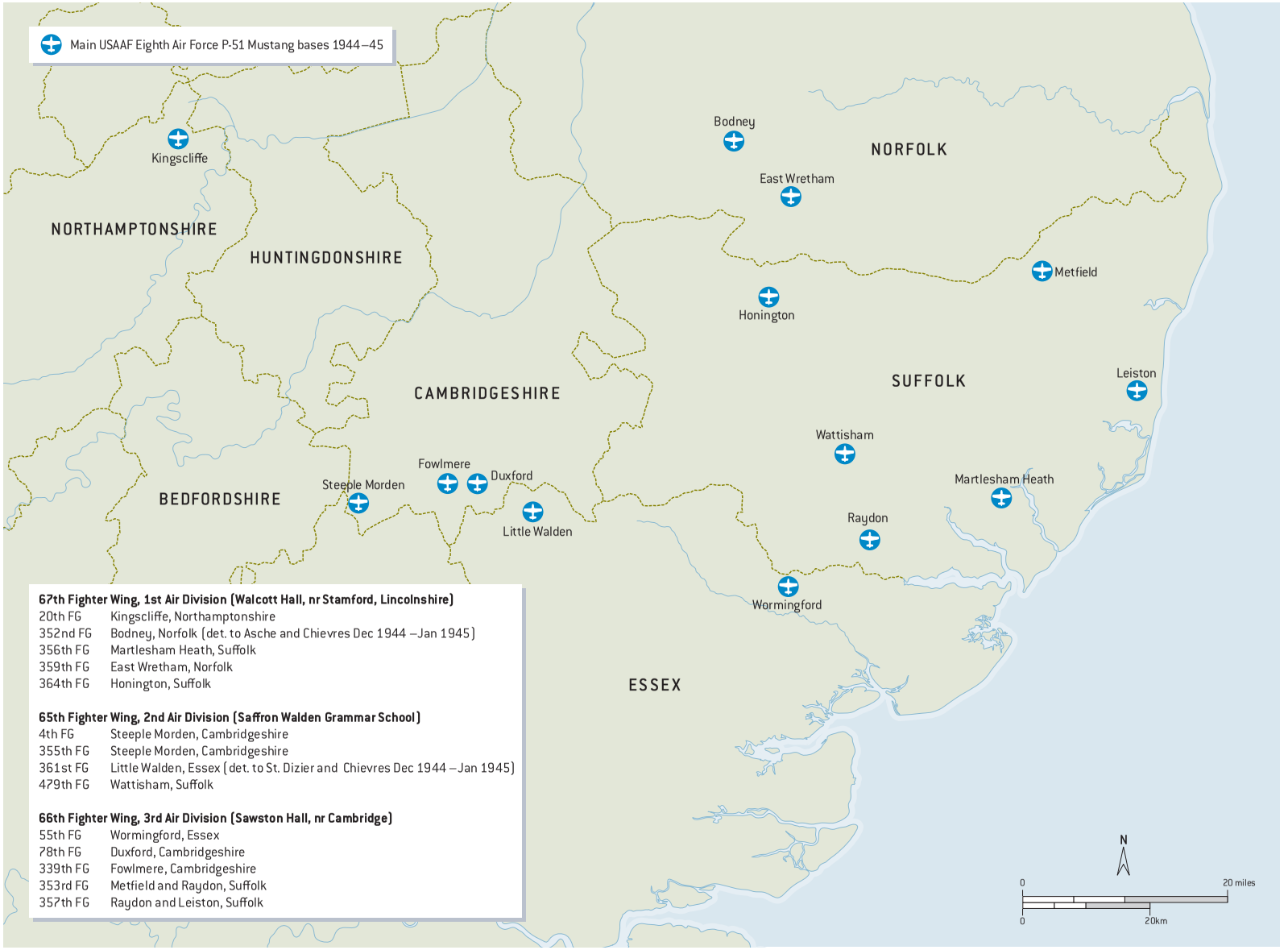
In a training manual entitled *The Long Reach* prepared in mid-1944, Kepner was able to boast that with the P-51, "where the bombers go to bomb, the fighters go to

A twin-engined P-38J Lightning (probably from the 1st FG) flies close to B-17Gs of the 2nd BG following the failure of one of its engines during a Fifteenth Air Force mission in the clear skies of the MTO. Viewed initially as the best long-range escort fighter, the Lightning did not reach the ETO until late 1943. The aircraft seen here has an oil-streaked nacelle and a feathered propeller. With the effectiveness of his fighter seriously compromised, the P-38 pilot has wisely sought the safety of the aircraft he was supposed to be protecting. When it arrived, the P-51 outshone the temperamental P-38 in the ETO/MTO. (USAF)

protect them. Together they wrought, and are wreaking, a vast destruction upon the enemy, and together they have fought him out of the air to the point at least where he dares contest our passage only sporadically, and at moments especially opportune for him." This fundamental philosophy was maintained by the USAAF through to October 1944, when the first encounters between the P-51D, seen by the Americans as the ultimate in piston-engined fighter development, and the revolutionary new Me 262A-1a, to which the Luftwaffe had pinned so much hope, took place.

In the fall of 1944 the Allies believed that they had Nazi Germany on the back foot. However, nothing could be taken for granted, least of all in the air. Strategic bombing remained crucial to the success of Allied war aims, and in conjunction with RAF Bomber Command at night, the USAAF continued its relentless daylight attacks on a range of enemy industrial and military targets – something that could only be done with an adequate fighter escort, a role increasingly falling to the P-51 squadrons.

In October 1944, the Eighth Air Force fielded 12 Mustang groups (the 4th, 20th, 55th, 339th, 352nd, 353rd [which was equipped with the P-51D that very month], 355th, 357th, 359th, 361st, 364th, and 479th FGs) that were assigned to three Fighter Wings, the 65th at Saffron Walden, in Essex, the 66th at Sawston Hall near Cambridge, and the 67th at Walcot Hall near Stamford, in Lincolnshire. The 78th FG would convert to the P-51D/K from the P-47D in December and the 356th FG from the P-47D to the P-51D in November.



67th Fighter Wing, 1st Air Division (Walcott Hall, nr Stamford, Lincolnshire)

20th FG	Kingscliffe, Northamptonshire
352nd FG	Bodney, Norfolk (det. to Asche and Chievres Dec 1944 –Jan 1945)
356th FG	Martlesham Heath, Suffolk
359th FG	East Wretham, Norfolk
364th FG	Honington, Suffolk

65th Fighter Wing, 2nd Air Division (Saffron Walden Grammar School)

4th FG	Steeple Morden, Cambridgeshire
355th FG	Steeple Morden, Cambridgeshire
361st FG	Little Walden, Essex (det. to St. Dizier and Chievres Dec 1944 –Jan 1945)
479th FG	Wattisham, Suffolk

66th Fighter Wing, 3rd Air Division (Sawston Hall, nr Cambridge)

55th FG	Wormingford, Essex
78th FG	Duxford, Cambridgeshire
339th FG	Fowlmere, Cambridgeshire
353rd FG	Metfield and Raydon, Suffolk
357th FG	Raydon and Leiston, Suffolk

In the spring of 1943, strategic (to some extent), operational and administrative control of the fighter groups was assumed by VIII Fighter Command at Bushey Hall, near Watford. Although the priority was bomber escort, VIII Fighter Command was permitted to plan its own operations when escort was not required. That summer, the groups were assigned to the three fighter wings, which could plan and execute their own limited operations subject to authority from VIII Fighter Command. This changed in October 1944, when each of the three wings was assigned to an Air Division. At this point, the chain of command became Eighth Air Force Operations Command to an Air Division, to a Fighter Wing to a Fighter Group. From October 1944 to the end of the war it was usual for VIII Fighter Command to dispatch 300–600 P-51s (and sometimes even more) to escort the bombers.

The alert to prepare for a large-scale escort operation would normally be issued by Eighth Air Force headquarters at High Wycombe, in Buckinghamshire, to the duty officers at VIII Fighter Command at Bushey Hall and/or the Air Divisions in the late afternoon of the preceding day. A few hours later, in the evening, more detailed assignments would arrive by teletype giving targets, routes to targets and return, check points, and the size of the forces involved. VIII Fighter Command or divisional combat operations staff would then consult large, wall-mounted Status Boards to assess aircraft and pilot readiness and to determine how a mission would be flown dependent on range and the combat experience and capability of the respective groups. Orders would then be issued to the groups.

The P-51-equipped group assignments by Air Division were as follows:

1st Air Division (Brampton Grange, Huntingdonshire)/67th Fighter Wing
20th FG (Kingscliffe)
352nd FG (Bodney)
359th FG (East Wretham)
364th FG (Honington)
356th FG (with P-51s from 11/44 – Martlesham Heath)

Five P-51Ds of the 359th FG undertake an escort mission toward the end of the war. The Mustang nearest the camera is 44-15717 as flown by Maj Niven K. Cranfill, CO of the Group's 368th FS. It was in this aircraft that Cranfill would shoot down one Me 262 and inflict damage on another in the Leipzig area on March 19, 1945. The aerial victory would be Cranfill's fifth and last, thus giving him ace status. (Peter Randall collection)

Main Me 262 fighter bases
Neumünster
II./JG 7
Kaltenkirchen
I. and III./JG 7
Parchim
III./JG 7
Oranienburg
I. and III./JG 7
Berlin
Brandenburg-Briest
Stab
I. and III./JG 7
NETHERLANDS
Hesepe
Erprobungskommando 262
Achmer
Erprobungskommando 262
Kommando Nowotny
GERMANY
LUXEMBOURG
Kitzingen
II./KG(J) 54
Giebelstadt
I./KG(J) 54
CZECHOSLOVAKIA
Neuburg
III./KG(J) 54
FRANCE
Lechfeld
Erprobungskommando 262
Kommando Nowotny
III./EJG 2
III./JG 7
München-Riem
JV 44
Salzburg-Maxglan
JV 44
AUSTRIA
N
0
100 miles
0
100km

2nd Air Division (Ketteringham Hall, Norfolk)/65th Fighter Wing
4th FG Debden
355th FG Steeple Morden
361st FG Little Walden
479th FG Wattisham

3rd Air Division (Elveden Hall, Suffolk)/66th Fighter Wing
55th FG (Wormingford)
339th FG (Fowlmere)
353rd FG (with P-51s from 10/44 – Raydon)
357th FG (Leiston)
78th FG (with P-51s from 12/44 – Duxford)

To the east, opposing the Eighth Air Force from the autumn of 1944 was a small but expanding force of Luftwaffe Me 262 jet interceptors. The first assessment of the aircraft under operational conditions was undertaken by *Erprobungskommando* 262, set up at Lechfeld in December 1943 under the command of former *Zerstörer* pilot Hauptmann Werner Thierfelder. However, Thierfelder was killed on July 18, 1944 in unsubstantiated circumstances while flying a prototype Me 262 over southern Germany.

Commanded since August by Hauptmann Horst Geyer, in reality, this small trials unit achieved little operationally, and by September it had around 12 aircraft on strength and 17 pilots – hardly much with which to go to war against the USAAF. That month Generalmajor Galland, the *General der Jagdflieger*, instigated some structural changes to the unit, assigning the staff echelon of the *Kommando* as the nucleus of a new III./*Ergänzungsjagdgeschwader* (EJG) 2 at Lechfeld intended to oversee all future jet fighter training. The component *Einsatzkommandos*, meanwhile, were moved north to concrete runways at Hesepe and Achmer so as to provide the units with a suitable environment from which the jets could operate.

On paper, this appeared acceptable, but the reality was very different. Despite a strength of some 30 Me 262A-1as, most of the *Kommandos'* pilots remained largely untrained on the jet fighter, and their new bases lay directly beneath the approach paths of those USAAF bombers, and their escorts, that were beginning to appear in ever greater numbers in German airspace.

However, as delivery of Jumo 004 engines and production of Me 262 airframes began to gather pace, despite the Allies' best attempts to interrupt them, more jets became available. Finally, in August, Galland was able to order the establishment of a *Gruppe*-sized formation of three *Staffeln* (each with a nominal strength of 16 Me 262s), formed from the Achmer and Hesepe units, with which to deploy the jet fighter in greater scale. To lead the unit, he selected Austrian fighter ace Major Walter Nowotny, a recipient of the highest award to the Knight's Cross, the Diamonds, who had been credited with 255 victories with I./JG 54 in the East. For two of the unit's *Staffeln*, pilots with experience of twin-engined aircraft and blind-flying were drawn from 8. and 9./ZG 26, while the third was formed from scratch.

Known as *Kommando Nowotny*, the unit undertook a brief period of familiarization, and by September 1944 it had some 30 Me 262A-1s on strength. Indeed, during

An Me 262 banks through the sky, the efflux from its Jumo 004 jet units misting the air. Blessed with speed, the Me 262 nevertheless suffered from a wide turning radius – something that P-51D/K pilots would exploit. (EN Archive)

October, in spite of Hitler's edict to build the Me 262 as a bomber, industry had delivered a total of 52 jet *fighters*, all but one going to Nowotny's unit.

The *Kommando* went into action for the first time on October 7 against one of the largest American daylight bombing raids so far mounted, aimed at oil targets at Pölitz, Ruhland, Merseburg, and Lutzkendorf. There were mixed results, with two bombers claimed shot down, although one pilot was killed and two aircraft lost as a result of being attacked by a P-51 – events which will be covered in the following chapter.

During the coming month *Kommando Nowotny* fought few engagements with the USAAF as poor fall weather largely curtailed its pilots from learning how to handle the new aircraft and its advanced technology and idiosyncrasies. Ten jets were damaged during the challenging processes of taking off and landing and only a few claims were made against the enemy. Nowotny's new pilots, most of them now drawn from conventional, single-engined fighter units, lacking sufficient training in instrument flying and with only two or three intended training flights, found the Me 262 with its effortless speed, short endurance, and rapid descent difficult to master.

Despite a damning indictment on the unit's capabilities from Messerschmitt test pilot Fritz Wendel (the first man to fly the Me 262), and Hitler's persisting demands that the jet should be employed as a high-speed bomber rather than as an interceptor, *Kommando Nowotny* struggled on into November. Then, on the 8th, disaster struck when Nowotny crashed to his death in an Me 262 having been intercepted by USAAF fighters on his way back from a mission. Four days after Nowotny's death, in the wake of Hitler's eventual, semi-reluctant agreement that the jet should be built as a fighter rather than as a bomber, it was decreed that a new *Jagdgeschwader*, JG 7, was to be formed, equipped not, as originally planned, with Bf 109G-14s, but rather with the Me 262A-1a. For the Luftwaffe, this could not come quickly enough.

THE COMBATANTS

P-51 PILOT TRAINING

In the introduction to the August 1945 Pilot Training Manual for the D-model Mustang, pilots were told, "The P-51D you are going to fly in is a truly great airplane. Mastering the P-51, however, takes plenty of hard work, for being a first-rate fighter pilot means being not only a pilot, but a whole crew – pilot, navigator, gunner, bombardier, and radio operator – all rolled into one. That's not a simple matter. It takes a good man to do the job right."

It was in the late 1930s that the then USAAC had begun to prepare for a lengthy war of global scale. In 1939, its aim was to train 1,200 pilots a year by 1941, but in 1940 that figure increased to 7,000 per year and in 1941 it had been raised again to 30,000. But even by then the Air War Plans Division of the War Ministry quite accurately forecast the risk of an extended war, lasting several years, against the powerful axis of Germany and Japan which would need no fewer than 85,000 trained pilots. The attack on Pearl Harbor had served to eliminate any sense of isolationism.

What America had, of course, was manpower, raw materials, manufacturing capability, and space, and thus from training 11,000 pilots in 1941, the USAAF's flying schools trained 82,700 in 1943 – a figure that greatly exceeded the numbers being trained in Germany and Japan. To place this in context, however, it should be mentioned that such figures were possible because losses in the early years of America's involvement in the war were lower than anticipated. Indeed, by April 1944, recruitment was reduced to 60,000 per annum and the standards of education and physical qualifications had been raised at the end of 1943, in contrast to many other air powers where they were lowered.

On January 23, 1943, the Flying Training Command had been established under the Office of the Chief of the Air Corps, with full responsibility for training pilots and aircrews while simultaneously the number of flying groups was increased. In July 1942, the USAAF listed 26 pursuit (fighter) groups on hand, with a further seven authorized. The figure to be attained by December 31, 1943 was 58, set against a figure of 114 heavy, medium, and light bombardment groups.

But such ambitious expansion, no matter how justified, inevitably resulted in strain and a depletion in quality. Eager to outbid the US Navy in order to ensure a ready supply of instructors, the majority of the latter recruited by the USAAF were civilians. When they started their jobs they were ordered merely to prescribe to a rigid curriculum, with no recognition of individual initiative or regard for what pilots would actually be confronted with when they arrived in a combat theater. One cadet pilot recalled that the training he received was the most incomplete he had ever received, "giving the maximum of pre-digested information in the minimum time."

2Lt Ben Drew stands against the rudder of a P-51 from the 54th FG at Bartow Field in Florida in late 1943 or early 1944, where he was retained as a gunnery instructor. Despite his smile, his position at Bartow was a source of some frustration to Drew. (Urban Drew collection)

In the US, throughout the war, the ubiquitous Boeing Stearman Model 75 biplane remained the standard primary trainer. When future P-51 ace "Ben" Drew underwent flight training on a Stearman at Tuscaloosa, Alabama, he found the accent of his Cuban instructor very difficult to understand as he shouted through the voice tube. Losing patience with his pupil, the irate instructor recommended that Drew be removed from the training program. Happily, events did not go that way.

Other aircraft used in elementary training included the Vultee BT-13 and BT-15 Valiant models. One pilot recalled that spin recoveries on such machines were "slam-bang affairs. Once in a spin, the canopy shook and rattled as if it might come off." North American Aviation, the builders of the P-51, also made the AT-6 Texan, which was used by the USAAF as an advanced trainer. This proved a very popular aircraft and was favored by cadets.

When it came to transitional fighter training, pilots learned on obsolete, but still operational Bell P-39 Airacobras and Curtiss P-40 Warhawks throughout the war. One pilot of the 35th FG recalled the P-39 as having "vicious handling characteristics." It was known to stall easily and took a long time to recover, although future ace and legendary test pilot Charles "Chuck" Yeager was one of the few who appreciated it. He recalled, "whipping through a desert canyon at 300mph, the joy of flying, the sense of speed and exhilaration 20ft above the deck make you so

Graduates and instructors of the 54th FG gather around a P-51B, possibly at the completion of their training at Bartow Field, in January 1944. With their basic training on the P-51 at an end, pilots would then be shipped abroad for service with a frontline squadron. (Urban Drew collection)

damned happy that you want to shout for joy. You feel so lucky, so blessed to be a fighter pilot."

In the early days of the USAAF establishment in England, such enthusiasm may have been reversed as the eager young fighter pilots stepped off the liners after their transatlantic voyages. Initial training in England did not always run smoothly. When it commenced flying Spitfire Vs at Atcham, in Shropshire, in June 1942, the 31st FG was found to suffer from deficiencies in gunnery, formation flying, navigation, combat tactics, and instrument flying. To compound this, pilots had to be trained in British operating procedures amidst poor weather and in congested facilities – very unlike conditions in the US.

RAF Bomber Command lent assistance, and a number of USAAF flight and squadron commanders were assigned temporarily to British units. By the end of the summer of 1942, however, all parties had worked hard to overcome such challenges, and a sense of cohesion and progress began to radiate across the growing USAAF infrastructure in England.

Stephen C. Ananian would fly 64 combat missions in 339th FG, P-51s and would be credited with an Me 262 shot down and two others damaged. The pattern of his training was typical. For two months he underwent Primary School training at Souther Field in Americus, Georgia, clocking up 60 hours in the Stearman. He was then given Basic Training at Greenwood, Mississippi, followed by a transfer to the Advanced Flying School at Jackson, in the same state, where he flew the AT-6 and P-40. By the time he had earned his wings at Greenwood and was commissioned

as a 2nd Lieutenant on March 12, 1944, Ananian could call himself a fighter pilot. His cadre was then sent to the fighter transition school at Dale Mabry Field in Tallahassee, Florida. Here, newly graduated pilots again flew the P-40 and were instructed in combat tactics.

Eventually, Ananian shipped to Britain and was assigned to a Pilot Replacement Pool at Goxhill, in Lincolnshire. "Here, we learned about the P-51 in ground school," he recalled. "No flying, just classes and lectures on the ground. Throughout all my training Stateside, I had flown many planes – P-40s, P-39s, P-47s, and P-38s. I thought I had flown them all and was prepared for combat. The only plane I had never flown was the P-51.

"We learned about England, geographically, the landmarks, checkpoints, navigational peculiarities, and a general indoctrination. We were there waiting to be assigned to a fighter squadron that had losses and needed replacement pilots. At the depot, they had a 'War Weary' P-51C set up on jacks in a hangar. You could climb into the cockpit and familiarize yourself with the controls, procedures, and the location of the instruments, switches etc. You practiced retracting the landing gear and putting it down again. I read all the manuals and sat in the cockpit, memorizing the location of all the controls and instruments. I climbed under the plane and inspected it from nose to tail and talked to the mechanics. I even learned how to change a tire!

Eventually, Ananian was posted to the 505th FS/339th FG, where he flew the Mustang for the first time, and despite a hair-raising start when he found the gear would not retract as a result of a sheared safety lock on his initial flight with the unit, he was sent on his first combat mission on October 5, 1944.

The first Eighth Air Force unit in England to equip with the greatly anticipated P-51 was the 357th FG at Raydon, in Suffolk. Its first B-model, a former RAF Mustang III with its "previous owner's" roundels still visible, arrived on December 19, 1943 and became an "immediate object of great interest" since most of the unit's personnel had never seen one before. Gradually, more P-51s trickled in, although there were never more than 17 machines available. Indeed, the bulk only arrived after the group moved to Leiston, in Suffolk, at the end of January 1944.

According to Merle Olmsted, a former mechanic with the 357th, any formal training on the P-51 was rudimentary if not non-existent. In reality, the group's pilots – already considered to "be" fighter pilots and therefore ready to fly any type assigned to them – simply built up experience by flying as many hours as they could in the Mustang. One pilot of the group's 362nd FS obtained his ten hours "training" by ferrying in P-51s from the 2nd Air Base Depot at Warton, in Lancashire. The first time he fired the Mustang's guns was when required to do so in anger whilst pursuing a German fighter. Some of the 357th's pilots did suffer crashes and required dual training time on an AT-6, which helped to restore confidence.

In January 1944, the 555th Fighter Training Squadron was established at Goxhill as an operational training unit for pilots arriving in the ETO, but as P-51s were in short supply it received cast-offs from operational groups. The 555th FTS became a part of the 496th Fighter Training Group, with its sister squadron, the 554th carrying

P-51D MUSTANG COCKPIT

1. Landing gear control lever
2. Elevator trim tab control wheel
3. Carburetor hot air control lever
4. Carburetor cold air control lever
5. Rudder trim tab control
6. Aileron trim tab control
7. Coolant radiator control
8. Oil radiator control
9. Landing light switch
10. Fluorescent light switch, left
11. Flare pistol port cover
12. Arm rest
13. Mixture control lever
14. Throttle quadrant locks
15. Throttle control
16. Propeller pitch control
17. Selector dimmer assembly
18. Instrument lights
19. Rear radar warning lamp
20. K-14A gunsight
21. Laminated glass
22. Remote compass indicator
23. Clock
24. Suction gauge
25. Manifold pressure gauge
26. Airspeed indicator
27. Directional gyro turn indicator
28. Artificial horizon
29. Coolant temperature
30. Tachometer
31. Altimeter
32. Turn-and-bank indicator
33. Rate-of-climb indicator
34. Carburettor temperature
35. Engine temperature gauge
36. Bomb release levers
37. Engine control panel
38. Landing gear indicator lights
39. Parking brake handle
40. Oxygen flow indicator
41. Oxygen pressure gauge
42. Ignition switch
43. Bomb and rocket switch
44. Cockpit light control
45. Rocket control panel
46. Fuel shut-off valve
47. Fuel selector valve
48. Emergency hydraulic release handle
49. Hydraulic pressure gauge
50. Oxygen hose
51. Oxygen regulator
52. Canopy release handle
53. Canopy crank
54. IFF control panel
55. IFF detonator buttons
56. VHF radio control box
57. Rear radar control panel
58. VHF volume control
59. Fluorescent light switch, right
60. Electrical control panel
61. Circuit breakers
62. BC-438 control box
63. Cockpit light
64. Circuit breakers
65. Rudder pedals
66. Control column
67. Flaps control lever
68. Pilot's seat
69. Flare gun storage

out training on P-38s. Later, in the fall of that year, it was decided to set up an Operational Training Unit in each fighter group. It was realized that each group had its own procedures, and thus it was preferable for a trainee pilot to learn these as soon as possible – albeit in "war-weary" aircraft.

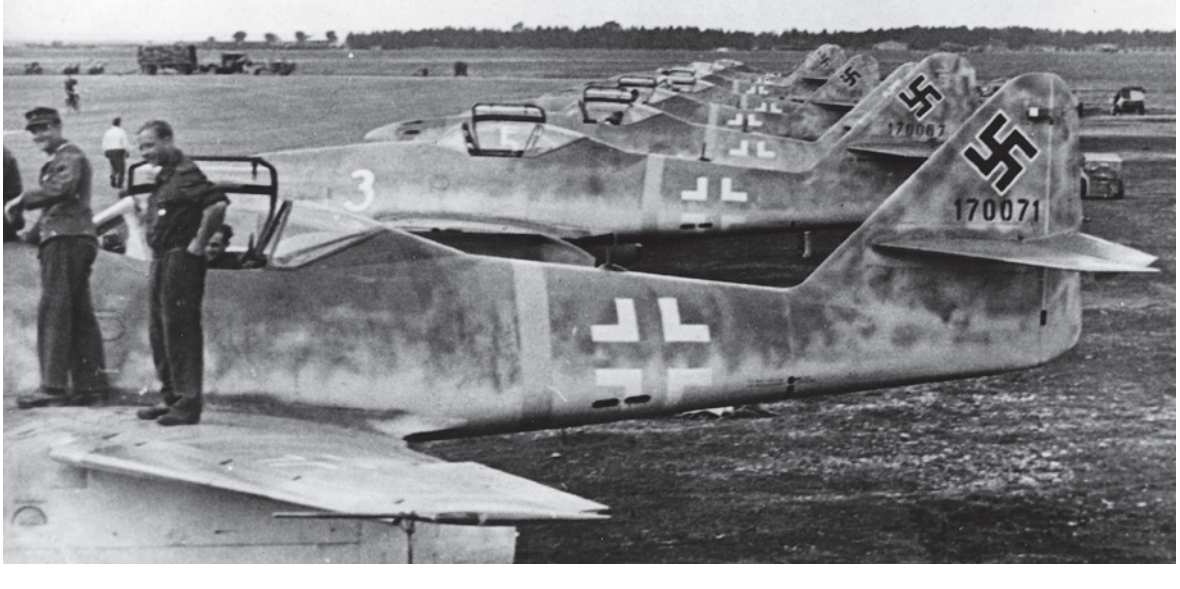
When Lt Col Don Blakeslee had lobbied Maj Gen Kepner for P-51s to replace the P-47s of the 4th FG at Debden at the end of 1943, the latter expressed concern that the demands of the strategic air offensive being waged against Germany did not allow lengthy conversion times or periods of training. He plainly stated that, in reality, days or even weeks would be needed for the 4th's pilots to transition from the big radial-engined Thunderbolt to the nimble inline-engined Mustang, with even more time required to train up groundcrew on the Merlin.

Blakeslee remained unperturbed, however, since a number of his pilots had flown Spitfires in the RAF with the trio of "Eagle" Squadrons (duly redesignated upon their transfer to USAAF control in September 1942) that now made up the 4th FG. He told Kepner that he could get his men flying Mustangs in combat within 24 hours. In effect, Blakeslee was true to his word. On February 22, 1944, a single P-51 arrived at Debden, and each pilot flew it for just 40 minutes. On the 28th, having collected their allocation of Mustangs at Steeple Morden, in Cambridgeshire, Blakeslee led his pilots out on a fighter sweep to France.

In the right hands, not only could the Mustang be mastered, but it would become one of the most potent warplanes in the skies over northwest Europe.

Me 262 PILOT TRAINING

Like the USAAF, Luftwaffe fighter pilot training for piston-engined aircraft followed a well-established, prescribed route, although as the war progressed it was adapted to



The future has arrived in the form of eight new Me 262A-1as of *Erprobungskommando* 262, seen here lined up at Lechfeld in September 1944 shortly after they had been flown in from Messerschmitt at Leipheim. Under the command of Hauptmann Werner Thierfelder, *Erprobungskommando* 262 was the world's first jet fighter unit. (EN Archive)

One of the Luftwaffe's most accomplished fighter aces and unit commanders, Oberstleutnant Heinz Bär was appointed to lead the Me 262 training and conversion *Gruppe* III./EJG 2, based at Lechfeld. This posting was seen as something of a dismissal as Bär had fallen foul of Göring, who transferred him away from frontline command. He is seen here at Lechfeld on the wing of his Me 262 "Red 13." He is believed to have achieved around 220 aerial victories. (EN Archive)

changing and increasingly adverse conditions. Training for jet aircraft thus involved rudimentary and ad hoc methods.

In the fall of 1944, 10. *Staffel* of III./EJG 2 had been formed around the remnants of *Erprobungskommando* 262 at Lechfeld. The intention was to establish a dedicated Me 262 operational training unit that would offer pilots converting to the jet a comprehensive and thorough training program. Initially, about 50 pilots were assembled from both fighter and bomber units, and fighter school staffs, and a selection was made of promising new pilots who were about halfway through their operational fighter training. The pilots were given a pre-jet flying course that consisted of finishing their regular 20 hours of flying time in conventional fighter aircraft with the throttles fixed in one position to reproduce a technical problem found in flying in the Me 262, the throttles of which were not to be adjusted in flight at high altitudes.

Upon arrival at Lechfeld, all pilots were given three days of theoretical instruction in the operation and functioning of jet engines and the features and flying qualities of the Me 262. They also practiced operating the controls in a wingless training model. This introduction was followed by a course at Landsberg in the operation of conventional twin-engined aircraft. Pupils accumulated five hours of flying time in a Bf 110 and a Siebel Si 204, practicing take-offs, landings, flight with the radio course indicator, instrument flying, and flying on one engine. Upon completion of

the course, the pilots returned to III./EJG 2 at Lechfeld, where they received one more day of theoretical instruction prior to commencing their conversion onto the Me 262.

Practical instruction on the aircraft began with half-a-day spent starting and stopping the jet motors and taxiing. Flying instruction consisted of a total of nine take-offs to familiarize the pilot with fuel flow, aerobatics, high altitude, aerial maneuvers, formation flying, and gunnery practice. This was considered to be the minimum with which to qualify a pilot for operational readiness on the Me 262. However, such training was severely restricted due to the shortage of two-seat Me 262B-1s, and even by the end of January 1945, III./EJG 2 recorded only three such machines on strength.

The unit was helped, however, by the appointment of Oberstleutnant Heinz Bär as its commander. One of the *Jagdwaffe*'s most renowned fighter aces and leaders, Bär could trace his service career back to 1938. On September 25, 1939, he claimed his first victory in the West. After six years of war, with service on all major fronts, Bär had been credited with more than 200 victories flying the Bf 109 and Fw 190 and been awarded the Swords and Oak Leaves to the Knight's Cross. However, in mid-1943 he had clashed with Göring over the *Jagdwaffe*'s increasing inability to match Allied air power in the Mediterranean, resulting in Bär being transferred to France "for cowardice before the enemy" and demoted. Although rehabilitated by late 1944, Bär's appointment to III./EJG 2 following many months as *Geschwaderkommodore* of JG 3 was seen by his peers as him being sidelined to some extent.

Even before the application of Bär's usual energy to the organization of III./EJG 2, throughout December 1944 the number of pilots undergoing training at Lechfeld had increased dramatically in proportion to the size of the cadre of instructors assigned to the *Gruppe* – a total of 135 trainee pilots for only 28 instructors, with the ratio of aircraft to pilots being even lower.

In the meantime, by March 1945 the dismissed *General der Jagdflieger*, Generalleutnant Adolf Galland, had established *Jagdverband* 44 – his own unit of "exiles" – at Brandenburg-Briest essentially to "prove" to the higher authorities that the Me 262 was an effective jet *fighter* (see *Osprey Aviation Elite Units 27 – Jagdverband 44* for further details). Galland had secured a small number of Si 204s for training purposes, this sturdy utility aircraft proving ideal for twin-engined take-offs and landings, instrument instruction, navigation, and flying on one engine.

By March 14, JV 44 had taken delivery of its first Me 262s. Fifty-five victory ace Erich Hohagen joined the unit early on, and recalled post-war:

> I had only received one week's training on the Me 262 at Lechfeld, as far as I remember, but I was very proud and honored to fly it since I was still suffering from a head fracture that had occurred one month before. It was the absolute fulfilment of my flying career, and I knew for sure that, at that time, no further enhancements could be made. It was the biggest step since the Wright brothers flew an aircraft heavier than air.
>
> Basically there was no similarity in flight characteristics compared to other aircraft I had flown, and although it was easier to handle on the piloting part, things were much

more critical on the flight safety side of things. For example, the engines could have been improved and better fatigue resistance built in. I also felt that the hydraulic system was insufficient, and that there would have been benefit from the installation of dive brakes.

One of the most famous names to join Galland's unit of discontented outcasts was Hauptmann Walter Krupinski, who had flown more than 1,100 operational missions in which he had been accredited with 197 confirmed aerial victories. He had also been wounded five times, bailed out on four occasions, and survived numerous crash landings. By March 1945, Krupinski, a recipient of the Knight's Cross with Oak Leaves, had effectively been made redundant by the continual regroupings and redesignations of the various Luftwaffe fighter *Geschwader*.

His "training" on the Me 262 began in earnest on April 2, 1945 at JV 44's second base at München-Riem, a lone fighter being hauled out onto the concrete start platform on the western edge of the airfield. Galland's deputy, Oberst Johannes Steinhoff, was the instructor. Krupinski remembers:

> That morning I sat in the cockpit of an Me 262 at Riem. I had a hell of a bad head, the result of too many drinks the night before! Steinhoff was standing on the port wing. He said, "The most difficult thing with this type of aircraft is to start the engines. I'll do that for you".
>
> There was no reading any books or anything like that. There was no "training program". He just gave me some basic information, enough to get started. "It's very tricky," he said. "On take-off you need a very long time until you get airborne. Don't do anything in a hurry. On landing, it's the other way around – you can't get the speed back down to a normal landing speed. She's fast, very fast!" Actually, I found that taking off in the Me 262 was fairly easy because the nose wheel rolled nice and smoothly, but the problem, as Steinhoff had said, was that the engines didn't accelerate and bring up speed fast enough. You needed the whole length of the airfield before you reached an adequate take-off speed. At Riem, the strip we used was about 1,100m long, and only after about 1,000m did you have the lifting speed to come off the field.
>
> Anyway, I prepared myself for take-off. I closed the canopy and threw a quick glance over the instrument panel. Brakes off. Slowly, like a lame duck, the bird began to roll. But then the end of the runway, as I predicted, came towards me very quickly. A glance at the speed indicator told me I was moving at 200km/h. Pulling gently at the stick, I got into the air. No drag, and she climbed swiftly. Landing-gear up. Throttle lightly back

The combat-scarred Major Erich Hohagen appears to gaze uncertainly from the cockpit of Me 262 "White 2" of III./EJG 2 at Lechfeld in the fall of 1944 as he undergoes familiarization training on the new jet fighter. Hohagen was a highly experienced and tenacious fighter pilot who had been both wounded and shot down on several occasions. He took over command of III./JG 7, but his time with that *Gruppe* would be relatively short-lived and he went on to join JV 44. Hohagen was awarded the Knight's Cross on October 6, 1941 and ended the war with 55 victories, although none of them in the Me 262. (EN Archive)

Me 262 COCKPIT

1. Airspeed indicator
2. Artificial horizon
3. Variometer
4. Altimeter
5. Radio Compass
6. SZKK-2 ammunition counter
7. Tachometers
8. Exhaust gas temperature gauges
9. Fuel injection pressure gauges
10. Fuel gauges
11. Cockpit heat control
12. Fuel counters
13. Engine starter switches
14. Gun camera switch
15. Free air temperature gauge
16. Hydraulic pressure gauge
17. Nose wheel brake
18. Ventilator control
19. Vertical speed indicator
20. Turn-and-bank indicator
21. Oil pressure gauge
22. AFN-2 radio navigation/ homing indicator
23. Clock
24. Revi 16B Gunsight
25. Oxygen flow meter
26. Oxygen contents gauge
27. Emergency landing gear handle
28. Emergency flaps handle
29. Horizontal stabilizer trim control
30. Horizontal stabilizer trim indicator
31. Landing gear indicator lights
32. Fuel shut-off selector lever
33. Throttle controls
34. Oxygen control valve
35. Main light switch
36. Rudder pedals
37. Control column
38. Pilot seat
39. Canopy release lever
40. Switches panel
41. Windshield heater switch
42. Flare release switch
43. Bomb release handle
44. Bomb control panel
45. Circuit breaker test panel
46. FuG 25 IFF panel

to 8,000 rpm. I climbed and the speed grew and grew – 350, 400, 500, 600 km/h – there seemed no end to its speed. Still I climbed. It was fantastic! Nothing like the Bf 109.

For my first roll in the climb I used only ailerons, moving with lightning speed – neither rudder nor thrust were needed and at 6,000–7,000m I leveled out, the speed slowly approaching 900km/h. So there I was, flying on my first mission, though, I suppose, it was more of a solo transition flight really.

Another very experienced fighter ace to fly the Me 262 with JG 7 from March 1945, and to experience similar "training" to Krupinski, was Oberleutnant Walter Schuck, one of the most successful *Experten* with JG 5 in the Far North. He had been awarded the Knight's Cross on April 8, 1944 in recognition of his 84 victories, with the Oak Leaves following on September 30. When Schuck asked the *Kommodore* of JG 7 how the Me 262 conversion program was organized, he was told to, "Go and stand outside next to the runway and watch how the others do it."

After several days of carefully watching and studying how the jets were handled, Schuck climbed into an Me 262 and received a brief run-through from one of his more experienced comrades on the jet's instruments, operating procedures and idiosyncrasies. Schuck then took off on his first flight. He found the performance of the jet astonishing. Sometime later, safely back on the ground, Schuck emerged from the cockpit with his knees shaking and his overalls soaked in sweat.

Based north of Brandenburg-Briest at Parchim at this time was Leutnant Walther Hagenah of 9./JG 7, who had previously claimed 16 victories (nine of which were heavy bombers) with JG 3. He had arrived at Parchim with no prior training on the Me 262:

We were not even allowed to look inside the cowling of the jet engines because we were told that they were secret and we did not "need to know" what was there!

The danger in being sent straight to an operational unit, however, was that one could do no training if there were not enough serviceable aircraft for operations. Our "ground school" lasted for about one afternoon. We were told about the peculiarities of the jet engine, the danger of a flame-out at high altitude and the poor acceleration at low altitude. Then we were told of the vital importance of handling the throttles carefully or else the engine might catch fire.

On the day before my first flight in the Me 262, I had a brief flight in a Si 204 to practice twin-engined handling and asymmetric flying. Next morning, March 25, 1945, I made my first familiarization flight in the rear seat of a two-seat Me 262B – precisely 17 minutes, and accompanied by a weapons technician/instructor. I was greatly impressed by the Me 262. The take-off was easy, the visibility from the cockpit was marvelous after the tail-down Bf 109 and Fw 190, and there was no torque during take-off. The only real problem I found was that when I came in to land, I came in at normal speed, expecting the speed to fall away rapidly when the throttle was closed. But the Me 262 was such a clean machine.

Generally, training was unbelievably short – just an afternoon's chat and a short morning's accompanied flight, then, in the afternoon, one went solo. We had some pilots with only about 100 hours total flying time on our unit flying the Me 262. Whilst they might have been able to take-off and land the aircraft, I had the definite impression that they would have been little use in combat.

URBAN L. "BEN" DREW

A native of Detroit, Ben Drew was born on March 21, 1924. Educated locally at Wayne University and then the University of Michigan, he graduated with a degree in Political Science. The Japanese attack on Pearl Harbor impelled thousands of young men across the US to enlist to defend their country. Having registered at a USAAC recruiting office on his 18th birthday in March 1942, Ben was eventually called up in August. After completing his Basic and Pre-Flight training in USAAF Training Command, he commenced his flying career under the Aviation Cadet Program at Tuscaloosa, Alabama, in October 1942, when he learned to fly a Stearman.

Following something of a rocky start, he was commissioned as 2nd Lieutenant on October 1, 1943 at Aviation Cadet Flight School at Marianna Field, in Florida; he was then posted to the 56th FS/54th FG – the P-51 Replacement Training Unit – at Bartow Field, also in Florida. Drew demonstrated such an affinity with the Mustang that he was retained at Bartow as a gunnery instructor. Despite logging hundreds of flying hours, Drew did not enjoy the posting, as he longed to see combat in the ETO. Things took a turn for the worse when, out of sheer frustration at having his requests for an operational assignment denied, he made an unintentional low-level pass over a colonel in the process of reviewing his troops, which caused all present to "hit the deck". Upon return to Bartow, Drew was informed by his CO that he would be receiving disciplinary action for his unwelcome "buzz" flight. This eventually took the form of a posting to VIII Fighter Command in England!

In May 1944, after sailing to England from New York aboard the *Queen Elizabeth*, he was assigned to the 375th FS/361st FG at Bottisham, in Cambridgeshire, under Col Thomas J. J. Christian Jr. The latter, a great-grandson of Lt Gen Thomas "Stonewall" Jackson, told Drew and his colleague William Kemp, who had traveled to England with Drew, that given their reputations as instructors, they could expect to be made flight leaders within a short period of time.

Perhaps, not surprisingly, with the skills he had amassed in Florida, it was not long before Drew achieved his first victory during a strafing run when he shot up a Ju 52/3m while on only his third combat mission. However, he hungered for a true aerial victory, and this duly came during a mission to France on June 25, 1944 while flying as wingman to his flight commander when he was able to shoot down a Bf 109. This meant he had scored a ground and an aerial kill within two weeks of commencing combat duty. On August 25, while undertaking an escort mission for B-24s of the 2nd Bomb Division to northern Germany, and with only one of his P-51B's four guns working, Drew came off the best in a lengthy, draining, one-on-one contest with a Bf 109 over Rostock. It was his second victory. The following day, he was assigned his own aircraft in the form of P-51D 44-14164/E2-D, which he christened *DETROIT Miss*.

Drew scored for the third time on September 11, claiming another Bf 109 over Göttingen, and then a week later, on the 18th, he shot down an He 111 over the Fehmarn Belt. However, Drew's finest hour would come on October 7 when he shot down two Me 262s. He would not receive official credit for the deed until after the war, however. These successes took Drew's final tally to six aerial victories and one strafing kill.

After the war, Ben Drew served with the Michigan Air National Guard, as well as being involved with several airline ventures in the US, Europe, Africa, and South Vietnam. In the late 1960s and early 1970s he worked as an aircraft broker, traveling the world widely. Urban Drew died in Vista, California, on April 3, 2013.

1Lt Urban "Ben" Drew. (Urban Drew collection)

FRANZ SCHALL

Born in the Austrian city of Graz on June 1, 1918, Franz Schall epitomized the successful Luftwaffe Eastern Front fighter ace, and would later become one of the highest-scoring day jet aces too, with claims for no fewer than ten P-51s shot down while flying the Me 262.

Schall joined the Luftwaffe in 1938, and during the early years of the war he served with the *Flakwaffe* as a gunner in the Linz area. Then, in late 1940, he successfully applied to be a pilot. Schall commenced his training on September 1, 1941, gaining his pilot's badge on February 10, 1942 and being promoted to the rank of Leutnant. He completed operational training a year later and was posted to Bf 109G-equipped 3./JG 52, which was based in the East near Kursk. Schall claimed his first victory – a "LaGG-5" (which was almost certainly a LaGG-3) fighter – on the afternoon of May 6, but it would be against the Soviet Il-2 ground-attack aircraft that he would be most proficient. He scored his first kill over this type on June 11. At this time, JG 52 was involved in intensive air fighting from the Kuban bridgehead up into the Ukraine.

He received the Iron Cross Second Class on July 14, 1943 at the height of the fighting around Kursk, which was followed 13 days later by the Mission Clasp for Fighters in Gold upon completing 110 missions – by which stage his tally had climbed to eight victories. On August 24 Schall was awarded the Iron Cross First Class. The fall of 1943 saw him develop into a very proficient fighter pilot during operations undertaken by I./JG 52 to cover the withdrawal of German forces from the Taman peninsula to the Crimea. By November 9 his score stood at 26, which included multiple "LaGG-5s" (probably a mix of LaGG-3s and La-5s), Il-2s, and U-2s.

During the morning of January 16, 1944, by which time I./JG 52 had been moved north to a base at Malaja-Wiska, 40km northwest of Kirovograd, Schall shot down a Yak-9 and two P-39s, with a La-5 destroyed on the ground. On February 22 – a day he claimed a U-2 – he was awarded the *Ehrenpokal* (Honour Goblet), the certificate for which noted his "outstanding bravery and special success as a fighter pilot." In August Schall accomplished the rare feat of shooting down no fewer than 11 Soviet aircraft in one day. On the last day of that same month he surpassed even this record when he was credited with 13 kills in one day (31st) for his 94th to 106th victories.

Throughout his service on the Eastern Front, Schall was shot down by flak four times. Coming down behind enemy lines on one occasion, he managed to make his way back to his unit. On October 10, Schall was awarded the Knight's Cross in recognition of 117 aerial victories and transfered to *Kommando Nowotny* to fly the Me 262. On November 8 – the day that Walter Nowotny was killed – Schall shot down three P-51s. From March 1945, having been promoted to Hauptmann, he served as *Staffelkapitän* of 10./JG 7 based, at the time, at Oranienburg. That month he would be credited with four more Mustangs, probably including machines of the 361st and 364th FGs.

Franz Schall was killed on April 10, 1945 when his Me 262 rolled into a bomb crater, turned over and exploded following an emergency landing at Parchim. Having shot down 61 Il-2s over the Eastern Front between June 1943 and September 1944 while flying with 3./JG 52 and ten P-51s in the defense of the Reich, Schall gained a reputation as a formidable pilot. Indeed, his comrade in 10./JG 7, Hermann Buchner, wrote of him, "Schall was a proper fighter. He had guts and a knack for a good formation."

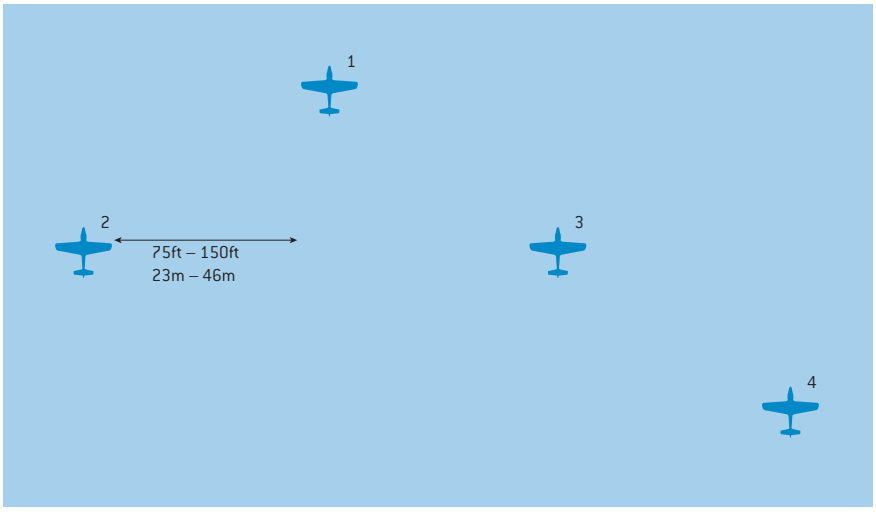
Credited with 133 victories in total during the course of 530 missions, Schall claimed all of his kills in the East with the exception of the 17 achieved while flying the Me 262 – six four-engined bombers and 11 Mustangs.

Leutnant Franz Schall. (EN Archive)

COMBAT

Since August 1944, the USAAF had been aware that the Luftwaffe had started to deploy the Me 262 in small numbers over the Western Front in both the fighter and bomber roles. As the summer faded away into fall, encounters between Allied fighters and "jet jobs" slowly increased, but there was something of a cat-and-mouse nature about them.

One of the earliest known engagements between a P-51 and an Me 262 took place on August 20 when a Mustang pilot reported spotting "a ship similar to an A-20." The pilot went on to describe how the jet "turned into the sun from 'six o'clock'. We turned into this attack, but due to the tremendous speed of the enemy



The "finger-four" formation, broadly resembling the fingers of an outstretched hand, was often adopted by P-51 Mustang squadrons to allow control and maximum visibility while on combat patrol. The No. 2 aircraft flew roughly 100ft below and behind the flight leader for optimum maneuverability. The second element flew 100ft behind the flight leader. These two aircraft would cross below on all turns.

At least four Me 262A-1as of *Kommando Nowotny* are seen on the hardstanding at Achmer during maintenance and refueling in the fall of 1944. Such a scene proved a tempting target for P-51 Mustang pilots, such as on October 7 when 1Lt Urban L. Drew of the 375th FS/361st FG attacked the airfield, destroying two of the *Kommando*'s jets in the process. (EN Archive)

aircraft, I was unable to get my guns on him. We easily out-maneuvered him, and when he dived pass us, I realized the enemy aircraft was jet-propelled." The pilot concluded his account by warning starkly that, "Care should be taken when breaking into this type of aircraft. The break should start much sooner than is necessary when fighting Me 109s or Fw 190s. This is due to the tremendous speed of the enemy aircraft."

It would not be until October 7 that a Mustang "jockey" would claim the first Me 262 "scalps." *Kommando Nowotny* had commenced operational flying four days earlier, although its first mission of any strength was not mounted until the 7th, when a formation of Me 262s led by ace Hauptmann Georg-Peter Eder prepared to take off from Achmer to intercept enemy bombers attacking oil targets. As the jets began to move across the concrete taxiways, one of Eder's Jumo engines suffered a flame-out and he was forced to abort. Three other Me 262s, flown by Oberleutnant Paul Bley, Leutnant Gerhard Kobert, and Oberfähnrich Heinz Russel, continued to taxi out for take-off, but at that moment the P-51D of 361st FG pilot 1Lt Urban L. Drew swooped down.

Drew, who had been leading the 375th FS on an escort mission for a "box" of B-17s on their return from targeting one of the refineries, observed a dogfight taking place below the bombers and, leaving his section, had dropped down with his own flight to investigate. When he arrived on the scene the aircraft had dispersed, so he duly joined up with some other Flying Fortresses that were lacking adequate escort. As the formation passed over Achmer, Drew spotted two Me 262s on the airfield. For a few moments he monitored their progress:

> The lead ship was in take-off position on the east-west runway and the taxiing ship got into position for a formation take-off. I waited until they were both airborne and then rolled over from 15,000ft and headed for the attack, with my flight behind me. I caught up with the second Me 262 when he was about 1,000ft off the ground. I was indicating 450mph and the jet aircraft could not have been going over 200mph. I started firing from about 400 yards, with 30 degrees deflection. As I closed on him, I observed hits all over the wings and fuselage.

This was probably Leutnant Kobert's aircraft, which blew up just as it lifted off the ground. Drew flew his P-51 straight through the flames and scattering debris of his victim:

> Just as I passed him I saw a sheet of flame come out near the right wing root. As I glanced back I saw a gigantic explosion, and a sheet of red-orange flame shot out over an area of about 1,000ft. The other jet aircraft was about 500 yards ahead of me and had started a fast climbing turn to the left. I was still indicating about 400mph and I had to haul back on the stick to stay with him.

It is unclear who was flying the Me 262, which collapsed under the P-51's machine gun fire, but it may have been Oberfähnrich Russel. Drew recounted:

> I had started shooting from about 60 degrees deflection at 300 yards and my bullets were just hitting the tail section of the enemy aircraft. I kept horsing back on the stick and my bullets crept up the fuselage to the cockpit. Just then I saw the canopy go flying off in

A posed, but nevertheless classic photograph of 1Lt Urban Drew shaking hands with his crew chief, SSgt Vernon Davis, on the wing of the former's P-51D-10 44-14164 *DETROIT Miss*. Drew achieved the rare feat of destroying two Me 262s in one sortie in this aircraft. (Urban Drew collection)

Capt Ernest C. "Feeb" Fiebelkorn of the 77th FS/20th FG stands next to P-51D-5 44-11161 LC-N *June Nite* at Kingscliffe in November 1944. On the 8th of that same month, while flying this aircraft, he encountered Major Walter Nowotny as the German ace returned to Achmer in his Me 262. Fiebelkorn was subsequently credited with a shared kill. It would be his ninth, and final, victory of the war. (Peter Randall collection)

two sections and the plane rolled over and went into a flat spin. He hit the ground on his back at about a 60-degree angle. I did not see the pilot bail out. The enemy aircraft exploded violently, and as I looked back at the two wrecks there were two mounting columns of black smoke.

Amidst the chaos on the runway, Oberleutnant Bley crashed his aircraft, although he was able to escape. 1Lt Drew claimed, and despite the failure of his gun camera to record the action on film, was eventually credited with the destruction of two Me 262s.

The war against the jets intensified in November as the Luftwaffe increased its sortie rate with the Me 262. Oberfähnrich Willi Banzhaff of 3./*Kommando Nowotny* was forced to bail out after an encounter with P-51s over Holland on the first day of the month, while 24 hours later there was some cheer when a P-51 and a P-47 were shot down by Feldwebel Erich Büttner. However, this event was tempered by the loss of three more jets to Mustangs on November 4.

Worse was to come on the afternoon of November 8 when Major Walter Nowotny, the *Kommando*'s renowned leader and one of the most highly decorated pilots in the Luftwaffe, finally took off to engage the enemy in an Me 262. The ace shot down a four-engined bomber and a P-51 for his 257th and 258th victories, but as he returned home he was apparently intercepted by Mustangs believed to have been flown by 1Lt Edward "Buddy" Haydon of the 357th FG and ace Capt Ernest C. "Feeb" Fiebelkorn of the 20th FG, each of whom have been credited with a shared kill. Whatever the case, a short while later Nowotny's crackling voice was heard over the radio.

Oberfeldwebel Helmut Baudach was an Me 262 "veteran," having flown the jet fighter with *Erprobungskommando* 262 and *Kommando Nowotny* prior to being assigned to 10./JG 7. However, he was fatally injured as he bailed out of his aircraft on February 22, 1945 following a clash with P-51s near Schönewald. (EN Archive)

Adolf Galland witnessed events from the ground. "An Me 262 appeared out of the cloud and dived vertically into the ground. There was black smoke and an explosion." Nowotny's last words, though garbled, indicated that his aircraft was hit and on fire, and seconds later he crashed to his death.

After forming up in the fall of 1944 at bases in northern and southern Germany, *Jagdgeschwader* 7, as the Luftwaffe's first dedicated Me 262 wing, commenced operations with its jets in the defense of Berlin from December. Pilots from the new *Geschwader* had in fact faced the perils of combat while still undergoing training on

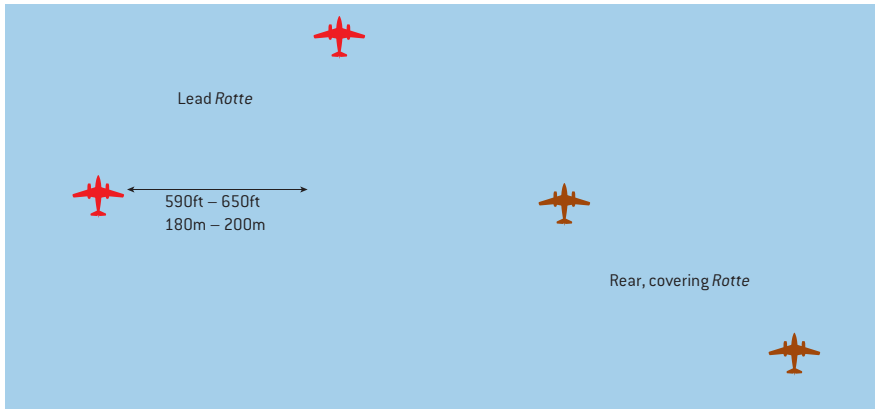
Clad in typical late-war style flying leathers, pilots of JV 44 walk past their unit's Me 262A-1as at Munich-Riem in April 1945. Wk-Nr 111745 "White 5" is nearest the camera, with "White 6" the next aircraft along. Note the primitive, and probably very inadequate, camouflage netting draped over the aircraft in an attempt at concealment from the air in the open space at Riem. By this stage of the war, the airfield was frequently the target for bombers and fighters of the Fifteenth Air Force. (Author's collection)

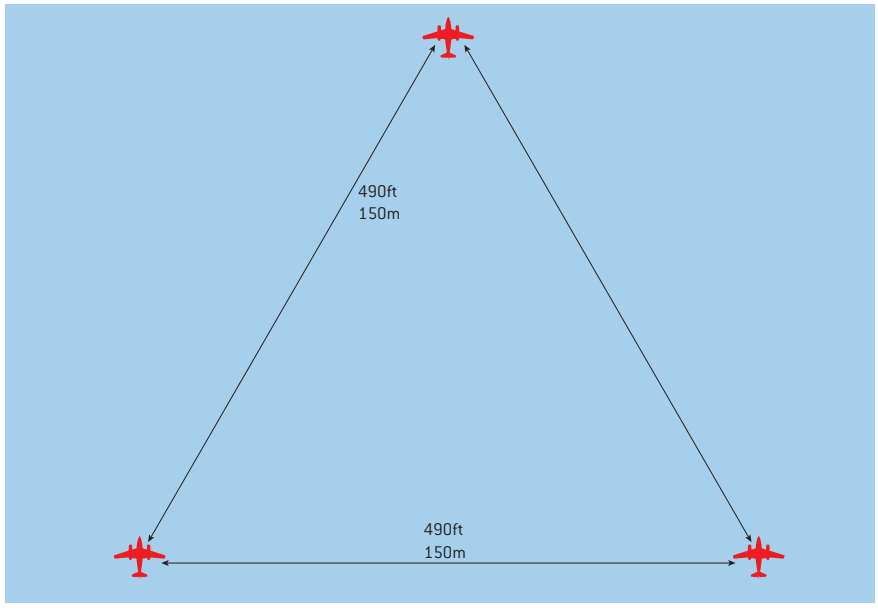
TOP

The standard four-aircraft *Schwarm* fighter formation evolved from the earlier three-aircraft *Kette*, as used by pilots of the *Legion Condor* during the Spanish Civil War and later favored by the Me 262 for tactical flexibility. The *Schwarm* comprised two *Rotten* in which one wingman, positioned behind, monitored and guarded the *Rottenführer*'s course. The two *Rotten* flew in a loose line abreast formation, but with the rear *Rotte* echeloned back so that effectively the wingman concept extended by *Rotte* to the whole *Schwarm*, and resulted in a "finger-four" formation.

BOTTOM

In the case of the *Kette*, once airborne, the aircraft would be staggered below and/or behind each other. *Ketten* would fly at 300m intervals. The pilots of JV 44 would also take off in elements of three, as runway widths at Munich-Riem allowed this.





the aircraft. On November 18, for example, P-51s of the 353rd FG were strafing JG 7's training base at Lechfeld when 1Lt James F. Hinchey of the 351st FS spotted two jets off to his left diving away from him at about 4,000ft. "I turned into them," he later wrote, "and dove from 8,000ft, pulling 74" hg [mercury boost pressure] and 3,000rpm, with airspeed registering well over 550mph."

Hinchey went into a prolonged dive and chased the Me 262s for 15 minutes, flying at 600mph. "The enemy aircraft were apparently going to make a straightaway race of it. During that time neither of us was able to gain an inch on the other." Hinchey fired several bursts from 800 yards, but eventually his high-speed pursuit took him directly over the rooftops of Augsburg at 1,000ft, where the local flak batteries opened up at him. By this stage he was running low on fuel, and so he was forced to break off. "It is my opinion that if I had been able to pull about 80" hg, I would have been able to close steadily on both jet jobs."

Me 262s of III./JG 7 carried out a patrol near Magdeburg on December 23 and bounced a pair of photo-reconnaissance F-5 Lightnings under escort from Mustangs

of the 353rd FG. Oberfeldwebel Erich Büttner, a "veteran" of *Erprobungskommando* 262, shot down one of the F-5s prior to the P-51 escorts and Me 262s fighting a low-level battle during which Büttner and Oberfeldwebel Albert Böckl each claimed a Mustang. For their part, the Americans claimed two Me 262s, but none of the "victories" for either side can be verified. On the last day of the year another P-51 was lost to the guns of Oberfeldwebel Helmut Baudach.

In the relatively brief period that Me 262s were operational, air combat tactics and formations were fluid, and varied within the two predominant fighter units, JG 7 and JV 44, as time progressed. It must be stressed that the principal task for Me 262 pilots was to get to the bombers, using the unmatched speed of their aircraft to achieve this – getting into an effective attack position at about 1,000m range on a dead-level approach often proved challenging, however.

Once there, the pilot had the weight of armament in the Me 262 to wreak havoc on heavy bombers. Available weaponry included not only the MK 108 cannon but also batteries of wing-mounted 55mm R4M unguided rockets that were to be used specifically against larger targets such as bombers in massed formations. Frustratingly for JG 7 and JV 44, the rockets were not always in plentiful supply (see *Osprey Aviation Elite Units 29 – Jagdgeschwader 7 'Nowotny'* for further details).

When JG 7 entered into combat operations at anything like a meaningful level in February 1945, its pilots tended to adopt the traditional Luftwaffe fighter flight element of the four-aircraft *Schwarm*, which was broken down into two sections of two-aircraft *Rotten* each comprised of a leader and a wingman flying slightly behind and above. But in JV 44, whose combat operations were flown mainly over southern Germany against B-26 Marauders and P-38 Lightnings of the Ninth and Fifteenth Air Forces, different tactics were adopted.

JV 44's tactics for attacking enemy bombers were greatly influenced by the low number of machines and pilots available for operations at any one time. It was quite usual for the *Jagdverband* to have just six serviceable jets ready for operations, and wherever possible with such small numbers, pilots tended to favor the deployment of their Me 262s in *Ketten* – the early-war, tried and tested element of three aircraft – as opposed to the *Schwarm*. The *Kette* was also preferred since, on most runways, it allowed three aircraft to take off side-by-side. Once airborne, the aircraft in a *Kette* would be staggered below and/or behind each other, but rarely behind and above, since the unsatisfactory field of vision from the Me 262 precluded this. Respective *Ketten* would fly at 300m intervals.

As a result of the Me 262's lack of maneuverability, maintaining formations in elements larger than *Ketten* proved more difficult. Once visual contact was made with a bomber formation, one group was selected as the target and the jets would maneuver behind it so as to mount their attack from the rear. Getting into an effective position from which to attack, however, was often difficult due to the great speed and turning radius of the Me 262. Decisions regarding the attack, therefore, had to be made quickly and at great distances from the target, which in turn made it difficult to correctly assess the bombers' range, course, and altitude.

From the perspective of a P-51 pilot, just successfully engaging an Me 262 in combat was a challenge. In order to stand any chance of catching a fully functioning Messerschmitt spotted trying to attack bombers, the pilot had to immediately drop

OVERLEAF

The scene near Quackenbrück on November 8, 1944, a few seconds before Leutnant Franz Schall of 2./*Kommando Nowotny* was forced to bail out of his Me 262A-1a "White 1" while being pursued by 1Lt James W. Kenney of the 362nd FS/357th FG. Schall had attacked a pair of P-47's, downing one, while the other belly-landed (he claimed "P-51s"). However, it was as he then approached a formation of B-17's near Quackenbrück that he would face his Mustang Nemesis. The P-51 of 2Lt Warren B. Corwin, also of the 362nd FS, had developed engine trouble over Merseburg, and escorted by James Kenney, Corwin had turned for home. They spotted Schall's Me 262 as it passed through the bomber formation, the German ace unwittingly turning towards the two Mustangs as he pulled away from the "heavies." Kenney opened fire and "got a lucky shot." He then entered into a chase with Schall toward the east. The Mustang pilot pulled past the Me 262 and had to drop his flaps to stop over-running the German jet. The two aircraft began to descend toward cloud, with Kenney firing bursts at the Me 262, which maintained a steady course, attempting little evasive action. Kenney managed to stay on the jet's tail, flying at 300mph and opening fire at 250 yards. Smoke trailed from the right nacelle and Schall bailed out at 4,000ft, his engines having seized. Corwin was posted as missing in action, and his fate remains unknown. He was, however, apparently heard over the radio by two other P-51 pilots announcing that "A son-of-a-bitchin' jet job got me."

Five Mustangs return to base with their 150-gallon external tanks still in place (the sixth machine in the background has no tanks), indicating no aerial combat during the soon to be completed escort mission. VIII Fighter Command ordered its pilots to stop dropping these tanks merely to chase jets, as without them the Mustangs lacked the range to escort bombers all the way to distant targets and back. (EN Archive)

his fighter's external tanks, which then adversely affected the Mustang's key asset – range. This in turn meant a P-51 could no longer escort bombers all the way to a distant target. "This left the bombers unprotected and juicy targets for conventional fighters," recalled Stephen C. Ananian of the 339th FG. "This tactic was taking a heavy toll. Eighth Air Force ordered the practice of dropping tanks merely to chase jets to be stopped. We were ordered not to chase the jets unless we were directly attacked."

During the early afternoon of January 14, 1945, however, Unteroffizier Helmut Detjens was fortunate to escape with his life after he was set upon by three P-51s of the 351st FS/353rd FG. He was part of a modest force of Me 262s from 9./JG 7 that had been sent up to assist piston-engined fighters of JG 300 and JG 301 in the interception of more than 600 B-17s and B-24s, and their escort, tasked with bombing oil targets in northern Germany. Detjens' opponents had been escorting Liberators on their outward leg when his Me 262 and that of Unteroffizier Heinrich Wurm, with whom he was flying, were spotted by pilots of the 351st FS flying north at around 10,000ft. The Mustang pilots, led by 1Lt B. J. Murray, dived at the Me 262 from out of the sun. 1Lt John W. Rohrs quickly identified their quarry:

> I recognized the type of enemy aircraft and set my K-14 gunsight for a 40ft wingspan. At approximately 300 yards, Lt Murray and I opened fire. My flight leader took the one on the left and I took the one on the right. I fired approximately a one-second burst, observing smoke and fire from the right wing root and jet nacelle. The enemy aircraft being attacked by Lt Murray broke sharply to the right in front of me and I had to break in the same direction to avoid a mid-air collision.
>
> In doing so, I had to break off combat with the jet I was firing on, but it also put me in a good position to attack the one that broke in front of me. I gave him a short burst

before I noticed that the pilot had already bailed out. I then completed my 360-degree turn to the right and started out after the other jet, which had been damaged sufficiently by my first burst to keep him from out-running me. I closed to approximately 700 yards with 40 degrees' deflection, firing a long burst and observing additional strikes and fire coming from his right wing root and extending past the nacelle. I believe that the pilot may have been wounded or killed either from my firepower or that of Lt Rosen's because he lost control of his ship and crashed in an open field from 50ft. The plane exploded and burned.

Rohrs claimed a shared kill with 1Lt George J. Rosen. Detjens had been forced to pull up sharply and bail out, but Wurm crashed into a field.

On February 3, despite the fact that III./JG 7 reported itself still not completely ready for combat, the unit embarked upon what was its first major operation in any "strength." One of a range of targets for the USAAF that day were the marshalling yards at Berlin-Tempelhof, which were assigned to the 116 B-24s of the 2nd Air Division. The small force of Me 262s sent to intercept the bombers and their escort made its mark, with the USAAF losing 23 B-17s, two B-24s, and seven P-51s. One of the latter fell to Unteroffizier Anton Schöppler, who had flown with I./JG 5 over Normandy. He would eventually be credited with eight victories in the Me 262, seven of them heavy bombers.

BELOW LEFT
Major Theodor Weissenberger was appointed *Kommodore* of JG 7. A recipient of the Oak Leaves to the Knight's Cross, he had spent much of his operational career in the Far North with JG 5. Weissenberger proved equal to the task of leading the jet *Geschwader*, and did so until the cessation of hostilities. He would end the war with 208 victories, eight of them with the Me 262 (seven B-17's and a P-51). (EN Archive)

BELOW RIGHT
Leutnant Rudolf Rademacher joined 11./JG 7 with 81 victories to his name after serving with I./JG 54 on the Eastern Front. He accounted for four P-51s and an RAF fighter shot down while flying the Me 262, as well as 11 four-engined bombers. (EN Archive)

The Me 262A-1a assigned to Major Theodor Weissenberger, *Geschwaderkommodore* of JG 7, taxies out at Brandenburg-Briest in February 1945. The aircraft carried the tactical number "4" in green on its nose, directly beneath the running fox emblem of the *Geschwader*. (EN Archive)

On February 9, the Eighth Air Force returned to northern and central Germany, this time striking at oil, transport, and airfield targets. In the Berlin area a few Me 262s from III./JG 7 attacked B-17s. During this mission, Leutnant Karl Schnörrer claimed the first of two P-51s with which he would be credited.

Another JG 7 pilot to enjoy some significant success against the Mustang was Leutnant Rudolf Rademacher, a JG 54 veteran who had scored 90 victories flying under Nowotny in the East before serving as a fighter instructor. He had been wounded while flying an Fw 190 against bombers on September 18, 1944 and was awarded the Knight's Cross 12 days later for 81 victories. Having recovered from his wounds, Rademacher joined 11./JG 7 on January 30, 1945. On February 16, he took on a formation of P-51s in the Hannover area. His victim is believed to have been a Mustang from the Fifteenth Air Force-assigned 325th FG. By war's end Rademacher had shot down four P-51s, an unidentified RAF fighter, and 11 four-engined bombers while flying the Me 262.

Some 15 jets of III./JG 7 attacked P-51s of the 479th FG near Potsdam on February 21. The group quickly recovered, turning into the Me 262s, which broke away climbing before returning for a second strike from above and to the rear. The USAAF pilots involved reported:

> . . . this kept up for three or four breaks, neither us or Jerry being able to get close enough for a shot. Each time we would break they would climb straight ahead, outdistancing us.

Know your enemy. Flt Off Ralf Delgado of the 354th FG points to what the USAAF recognition diagram describes as "a single-seat, all-metal, flush-riveted monoplane with single fin. It is reported to have flown at 527mph at 13,000ft and is expected to reach 560mph at 29,000ft." Delgado, who is also holding a small model of the Me 262, was credited with the destruction of a jet belonging to I./KG(J) 54 over Giebelstadt on March 2, 1945. (EN Archive)

> The Jerry pilots were aggressive and experienced. They were not caught in a turn, and if caught in such a position would roll out and climb away. It was impossible to catch or climb with them. Fighting took place from 12,000ft up to 26,000ft. A P-51 cannot climb with the jet, particularly if it has an initial altitude advantage. However, a P-51 can out-turn the jet. Red Flight out-turned the jets just after being bounced by dropping their tanks. The jet is faster on a straight and level run. Its rate of roll was excellent, but its turning radius was poor.
>
> Their job seemed to have been to force us to drop our tanks so that we would have to leave. We were over southwest Berlin and we found the expenditure of gas while attempting to close very heavy. It was necessary to use full power all the time. The jets flew excellent formation and never allowed themselves to be caught in a bad position.

This encounter ended without loss to either side.

The next day JG 7 utilized all its available jets against some of the 3,000 Allied aircraft despatched to attack German transport and communications systems as part of Operation *Clarion*. The *Oberkommando der Luftwaffe* (Operations Staff) recorded:

> Thirty-four Me 262s of JG 7 took off, but were not able to engage the heavy bombers as they were immediately involved in intensive actions with enemy fighters. Only five enemy aircraft were shot down.

During this action the 353rd FG used its squadrons to both cover B-17s and conduct a freelance patrol. Engaged in the latter duty was future ace Capt Gordon B. Compton, who was leading the 351st FS through patchy cloud over the Brandenburg area in the early afternoon. His P-51s were flying a little behind the group leader, and fellow future ace, Maj Wayne K. Blickenstaff.

"Shortly after reaching our patrol area," Compton later reported, "enemy jet activity was reported near Brandenburg, and so we proceeded to that point. About ten miles away Maj Blickenstaff reported 'bogies' at his eleven o'clock, and since he was in a left turn at the time, I started a left turn to cut him off. I first picked up the 'bogies' flying string formation and in a diving left turn. There were four of them, Me 262s.

"I started after the No. 3 man, but he was too far away and I was unable to close, so I waited for the No. 4 man to pull out. He did and turned right in front of me. I did not have time to track and range my K-14 gunsight, so I picked out his line of flight and fired a long burst for him to fly through. I saw a few strikes on the right jet unit and it began leaving a trail of white smoke. With this unit crippled, the Me 262 was unable to pull away and I got dead astern of him, firing at about 350 yards. Pieces came off following one burst and finally he pulled up sharply to the left, climbing several thousand feet per minute. Then the right jet unit burst into flames and the pilot rolled over and bailed out."

This would be the first of Compton's two Me 262 victories, the second being scored on April 10.

Elsewhere in the action, Oberleutnant Günther Wegmann was leading 11./JG 7 and claimed a P-51, while Oberfeldwebel Hermann Buchner shot down a Mustang of the 364th FG for his second of an eventual six victories in the Me 262. I./JG 7 was also operational that day, but only two of its machines managed to take off – that of the *Staffelkapitän* of 3./JG 7, Oberleutnant Hans-Peter Waldmann, and his wingman, Oberfähnrich Günther Schrey. Waldmann claimed two P-51s around midday near Oschersleben. His final two victories, these took Waldmann's tally to 131 (121 of them in the East). He was subsequently killed on March 18 when he collided with his wingman, and future eight-victory Me 262 ace, Leutnant Hans-Dieter "Hadi" Weihs shortly after taking off from Kaltenkirchen. Weihs bailed out but Waldmann did not.

Following a three-day lull since the raid of February 28, JG 7 was back in action on March 3 when the *Geschwader Stab* and III./JG 7 combined to send up 29 Me 262s against a raid of more than 1,000 heavy bombers, with nearly 700 escort fighters, targeting oil, armaments, and transport targets across northern and central Germany. The jets attacked the B-17s of the 3rd Air Division in line astern from 6,000m between Braunschweig and Magdeburg. Oberfeldwebel Buchner managed to shoot down a P-51 and a B-17.

On March 14 Leutnant Alfred Ambs, who had joined III./JG 7 from JG 104, took off as part of a *Kette* of jets to intercept enemy reconnaissance aircraft. After flying for some 20 minutes, the three pilots spotted a pair of Mustangs flying west. Oberleutnant Joachim

The gun camera aboard the P-51D of future ace 2Lt Dudley M. Amoss of the 38th FS/55th FG captures the moments just before Unteroffizier Hermann Litzinger of III./KG(J) 54 bails out of Me 262 Wk-Nr 110942 B3+LS, near Obergrasheim on February 15, 1945. Many of the pilots of KG(J) 54 were former bomber men hurriedly "converted" to fly the Me 262 as a fighter. In reality, their "training" was insufficient and they were ill-prepared to deal with the many hundreds of Allied escort fighters found in Reich airspace daily by that stage of the war. (EN Archive)

Oberfeldwebel Hermann Buchner of *Kommando Nowotny* (and later JG 7) crouches on the join between the wing leading edge and the left jet engine of Me 262A-1a "White 7" at Lechfeld in order to speak to one of the groundcrew on October 20, 1944. Buchner, a successful former Fw 190 ground attack pilot, made the relatively rare transition to flying the Me 262. He was duly credited with 12 victories on the type, ranking him as the Luftwaffe's seventh highest-scoring jet pilot. He was awarded the Knight's Cross in July 1944 for 46 aerial victories – an extraordinary score for a ground attack pilot. (EN Archive)

Weber, flying with Ambs, opened fire prematurely. Alerted to the Messerschmitts' presence, the P-51 pilots took evasive action. Following a dummy break, the *Jagdflieger* used their superior speed to veer round and attack the Americans from head-on. Opening fire from 300m, Ambs watched as one of the Mustangs exploded before him.

On March 24, just four days after his first flight in an Me 262 of I./JG 7, Oberleutnant Walter Schuck and his wingman engaged an F-5 reconnaissance aircraft escorted by two P-51s in what soon became a draining aerial battle. Shortly before midday, Schuck had spotted "three black dots" approximately 120km southwest of Berlin in the Leipzig–Dresden area. At full speed, the two Me 262s came in behind the three American aircraft and opened fire. Schuck's wingman shot down the P-38, but the Mustang pilots made every attempt to avoid their jet-powered assailants by rolling, swerving, and diving. Doggedly, Schuck stayed with them and eventually chose an opportune moment to fire at each. In a formidable example of the power of the Me 262's MK 108s, Schuck recorded in his memoirs:

> In a fluid, diving curve I positioned myself behind the trailing Mustang of the trio and opened fire. The shells from the four 30mm cannon smashed with tremendous impact into the enemy machine, which was literally torn apart; the pilot of the Mustang was just able to bail out before it exploded in mid-air.

Schuck then quickly positioned himself onto the tail of the other P-51, whose pilot seemed unaware of the Me 262's presence. The *Jagdflieger* watched as the high-explosive rounds from his MK 108s "chewed through the right wing of the Mustang." Moments later the American fighter climbed and then fell back trailing smoke. "I was hugely impressed by the [Me 262's] devastating firepower," Schuck recorded.

The view from 1Lt John Cunnick's P-51 as he dived down on Oberfeldwebel Helmut Recker's Me 262 over Lechfeld on March 22, 1945. Cunnick, from the 38th FS/55th FG, downed the jet, from III./EJG 2, moment later. Recker did not survive. (EN Archive)

But as March gave way to April, even the most determined Me 262 pilot could tell that the air war was being lost. As with so many aspects of the Third Reich's war effort, the Me 262 was a case of "too little, too late." The Allied air forces were too powerful and had the resources to wage a draining war of attrition against the Luftwaffe.

April 4 was a tough day for JG 7. During the morning, some 15–20 jets of III. *Gruppe* led by 39-victory ace Major Rudolf Sinner took off, but as they did so P-51s of the 339th FG, which were conducting a sweep ahead of B-24s, appeared over Parchim. This was a very unfortunate turn of events for the Me 262 pilots, who had been caught at their most vulnerable moment. As Sinner climbed through the cloud in his rocket-laden jet, he spotted Mustangs diving towards him, but found it impossible to adopt an evasive maneuver due to his proximity to the ground. He attempted to fire off his R4Ms to lose weight, but the firing mechanism had failed and seconds later he was hit by fire from the eight P-51s now pursuing him.

With flames licking into his cockpit, Sinner managed a slight turn and bailed out. Although he avoided contact with the tail surfaces, his right leg had become entangled in his parachute harness and lines. Spinning through the air, he managed to land in a field, although he remained connected to his parachute. This duly dragged him along for several meters into a barbed wire fence. According to Sinner, the American fighters strafed him while he was on the ground, but eventually he was able to run for the cover of a plowed furrow.

That same day Oberleutnant Franz Schall of 10./JG 7 shot down a P-51, but he too was forced to bail out near Parchim shortly thereafter. He had claimed nine Mustangs destroyed in the Me 262 by that point.

As the B-24s unloaded their bombs over Perleberg, an Me 262 was apparently shot down by 1Lt Michael J. Kennedy of the 4th FG in his P-51D *Lil Aggie*. Kennedy reported:

> We were escorting a box of B-24s when all of a sudden eight Me 262s attacked our bombers. Two of the jets pulled up after making their pass, two others pulled the old 109 tactic of doing a "split-S" after their pass and the other four used little or no evasive action. I was at 18,000ft at the time and picked out one that started a gradual descent in a gentle starboard turn.

Having run into 262s before, I started down after him, leading the German pilot quite a bit. For what seemed a very long time I pointed my aircraft at a non-existent point hoping that I had planned correctly. Then all of a sudden it happened. I had increased my airspeed, gained on him and I was on his tail at extreme K-14 gunsight range. I opened fire and immediately observed strikes in the wing and the right engine nacelle. The right jet disintegrated and I flew through some of the bits and pieces and began to overrun the plane. I pulled off power, dumped combat flaps and went right on by him. I pulled into a tight port orbit, and just as I started to pull around, my wingman informed me that the Me 262 had exploded. I'd fired 607 rounds of API [armor-piercing incendiary] ammunition.

Six days later, on April 10, no fewer than 1,232 bombers of the Eighth Air Force struck at airfields and transport hubs, bringing nearly 900 fighters with them. The experiences of veteran ace Leutnant Walter Hagenah, flying one of a pair of Me 262s of 9./JG 7, typify the German predicament by this stage:

We received no instructions from the ground when airborne – our task was merely to "engage bombers over Berlin." Once above cloud at about 5,000m, I could see the bomber formation clearly at about 6,000m. I was flying at about 550km/h in a slight climb after them. Everything seemed to be going fine – in three to four minutes we would be with the bombers. Then, as an experienced fighter pilot, I had the old "tingling at the back of the neck" feeling that perhaps enemy fighters were about.

I had a good look around, and in front and above, I saw six Mustangs passing above me from almost head-on. At first I thought they had not seen me, and so I continued on. But, just to be on the safe side, I glanced back once more – and it was a good thing for me that I did, because at that moment I saw the Mustangs diving down and curving round on to the pair of us. With the speed of their dive, and the speed we had lost because of our climb, they stood a good chance of catching us.

Then they opened fire and tracer began to flash disconcertingly close to our aircraft. I opened my throttle fully and put my nose down a little to increase my own speed, and resolved to outrun the enemy fighters. I did not attempt to throw off their aim – I knew the moment I turned my speed would fall, and then they would have me. I told the Feldwebel on my left to keep going, but obviously he became scared because I noticed him weaving from side to side, then he turned away to the left. It was just what the Mustang pilots wanted, and in no time they had broken off from me and were on to him. His aircraft received several hits and I saw it go down and crash – my companion was unable to bail out.

I kept an eye on the enemy fighters at 4,000m and watched them reform

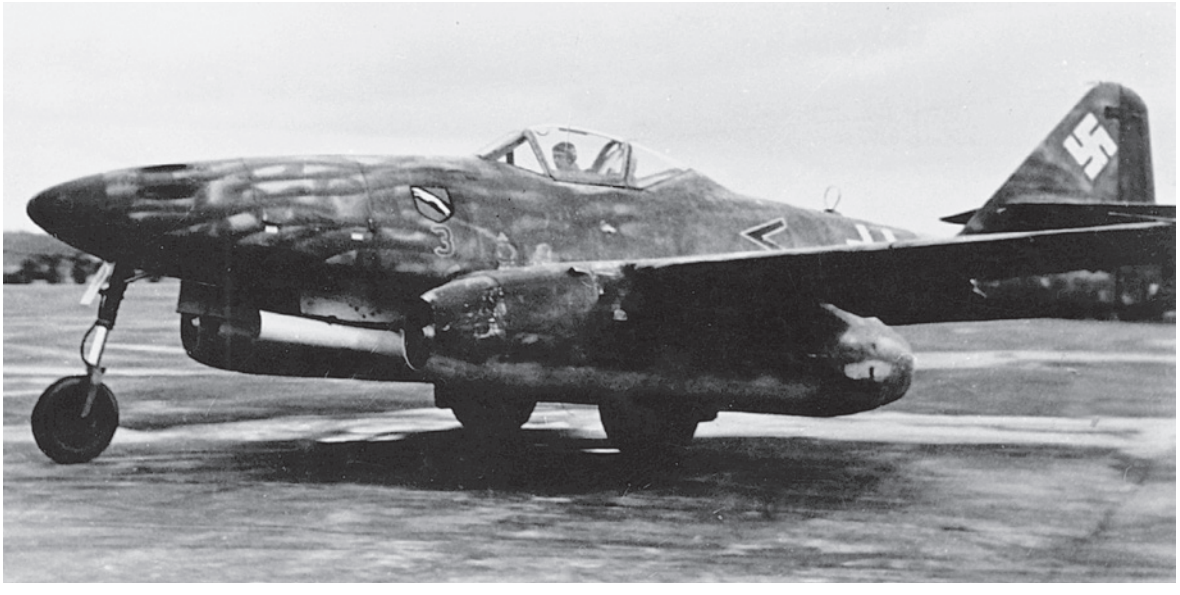
Squadronmates 1Lts Billy Clemmons and John Cunnick celebrate Cunnick's victory over the Me 262 of Oberfeldwebel Helmut Recker of III./EJG 2. Cunnick had maneuvered his P-51 inside Recker's turning jet as it passed low over the perimeter of Lechfeld airfield on March 22, 1945 and shot it down. (EN Archive)

ENGAGING THE ENEMY

On April 10, 1945, 9./JG 7 pilot Leutnant Walter Hagenah used his R4M rockets to shoot down two Mustangs from a formation of six. He did this by rapidly closing in on the P-51s from behind to a distance of around 500m, at which point he fired all 24 of his rockets to telling effect. The illustration depicts the moment Hagenah fired his R4Ms.

The 55mm R4M rocket was an unrotated, rail or tube-launched, single venturi, solid fuel propelled, multi-fin stabilized missile, with the warhead contained in an exceptionally thin one-millimeter sheet steel case. The latter was in turn enclosed in two pressed steel sections welded together and holding the Hexogen high-explosive charge. The missile benefited from a high charge weight to case weight ratio.

Batteries, to a maximum of 12 rockets, were launched from wooden underwing racks positioned outboard of the engines. The R4M was intended primarily as an anti-*bomber* weapon, designed to create panic within B-17 and B-24 formations and force them to scatter. Its deployment against fighters was much rarer. One JG 7 pilot described firing R4Ms from his Me 262 as "something beyond my conception. The destructive effect against the targets was immense. It almost gave me a feeling of being invincible." (See main text for Walter Hagenah's description of his attack on the P-51s).



Me 262A-1a "Green 3" of the *Geschwaderstab* of JG 7 prepares to move off across the concrete surface at Brandenburg-Briest in February or early March 1945. The aircraft is finished in a relatively rare application of streaked horizontal lines, and has been fitted with a pair of 21m W.Gr 21 air-to-air mortar tubes visible beneath the fuselage aft of the nosewheel. These weapons were only used in small numbers by Me 262s against USAAF bombers, the *Jagdwaffe* hoping that the mortars might prove effective when it came to dispersing formations. (EN Archive)

and turn round to fly westwards for home. Feeling vengeful, I decided to have a go at them. I rapidly closed in on them from behind, but at a range of about 500m, the Mustang leader started rocking his wings and I knew I had been seen. If I continued I knew that the enemy fighters would probably split up into two and curve round from either side onto my tail, so I resolved to strike first. I loosed off all 24 of the R4M rockets under my wings straight at the enemy fighters and I was very lucky – I hit two of them and they went down out of control. This time I had plenty of speed, and had little trouble in avoiding the fire from their companions.

But I had no time for self-congratulation because my own fuel was beginning to run short and I had to get down as soon as I could. I picked up a beacon on my receiver and found that it was the airfield at Köthen. I called up the airfield on the radio and I said I wanted to land there, but they called back and warned me to be careful as there were *"Indiana"* [enemy fighters] over the field.

When I arrived, I saw that there were enemy fighters about trying to strafe the field, but the light flak defenses were giving them a hard time and I managed to slip in unnoticed. Suddenly, however, it seems I *was* noticed, because almost as one, the Mustangs packed up and went home – perhaps they thought my own and other jet fighters had come to tackle them. Certainly they did not know I was short of fuel. I made a tight, curving approach and hurled the Messerschmitt onto the runway, breathing a sigh of relief at having got down safely. But then the Mustangs must have realized what was going on, and in a trice they were back over the airfield and it was my turn to have a rough time. Fortunately for me, the flak defenses were still on their toes and I was not hit.

However valiant the handful of Me 262 pilots were in their fight to defend the Reich, by early May 1945 such increasingly isolated attempts at resistance were slowly but surely extinguished by the sheer number of Allied fighters operating virtually unimpeded in German airspace. The last few remaining serviceable Me 262s now lay scattered across airfields as they waited for the Allied armies to arrive.

STATISTICS AND ANALYSIS

The closing months of World War II heralded the dawn of a new era in air combat in which a small number of new generation, jet- and rocket-powered interceptors (Me 262 and Me 163), bombers, and reconnaissance aircraft (Me 262 and Ar 234)

During a large-scale and intense aerial engagement with a formation of 16 Me 262s from KG(J) 54 on February 25, 1945, Capt Donald M. Cummings of the 38th FS/55th FG shot down two jets. He became one of only two USAAF pilots to be credited with two jet kills in one mission. (55th FG Association)

were pitted against the ultimate designs in piston-engined fighters, such as the Hawker Tempest V, the de Havilland Mosquito, and the P-51D/K Mustang.

As a fighter/interceptor, the Me 262's main advantages lay in its speed – in level flight, diving, and rate of climb – and ability to pack a hefty punch with its cannon armament and optional rockets. The jet's weak point, when it came to taking on the P-51, was its lack of maneuverability in the turn, during which it could become comparatively cumbersome.

The wonder of the P-51D/K lay in its balance of range and maneuverability stemming from the impressive mating of Edgar Schmued's design with the Merlin engine. However, from a tactical perspective, in order to see through its prime role of long-range escort to targets deep in Germany, the fighter needed drop tanks and, as has been recounted in the preceding chapter, once a pilot had been tempted to go after a "jet job" and released his tanks, that huge tactical advantage was at risk of being negated.

Nevertheless, bearing in mind the relatively small number of operationally ready Me 262s at any one time (100 or so across all units at the most), VIII Fighter Command groups accumulated some impressive scores against the Messerschmitt jet fighter. The 357th FG claimed 19 Me 262 kills to become the highest-scoring Eighth Air Force group. Five groups (4th [10], 339th [12], 78th [13], 55th [16.5], and 357th FGs) scored ten or more kills. In total, USAAF fighter units lodged 166.5 air-to-air destroyed, probable and damaged Me 262 claims. Additionally, there were numerous ground victories claimed in strafing runs.

Three pilots credited with either shared or full double jet kills achieved their scores where one victory was an Me 262 and the other an Ar 234. Only two pilots, 1Lt Urban L. Drew (361st FG) and Capt Donald M. Cummings (55th FG) achieved the distinction of shooting down two Me 262s in a single mission, and both were categorized as aces as well. According to research undertaken by aviation historian Stephen Chapis (see *Osprey Aircraft of the Aces 136 – Allied Jet Killers of World War 2* for further details), five USAAF pilots are credited with two full Me 262 kills (not shared, probable, or unconfirmed). They are:

Capt Donald H. Bochkay – 363rd FS/357th FG
Capt Gordon B. Compton – 351st FS/353rd FG
Capt Donald M. Cummings – 38th FS/55th FG
1Lt Urban L. Drew – 375th FS/361st FG
Capt Robert S. Fifield – 363rd FS/357th FG

Several Luftwaffe pilots lodged claims for more than one P-51 shot down. Oberstleutnant Heinz Bär, who commanded III./EJG 2 and, in the final days of the war, JV 44, is believed to have scored 16 victories while flying the Me 262, but it is not clear how many of these may have been P-51s. One of the highest known scorers against the Mustangs was Hauptmann Franz Schall of *Kommando Nowotny* and 10./JG 7, who is credited with ten shot down between late October 1944 and April 10, 1945. Schall's comrade Major Georg-Peter Eder is credited with six P-51s destroyed, plus a probable, between October 1944 and May 1945, including, remarkably, three in one day on November 8, with two more claimed the following day.

Several other pilots achieved multiple victories over P-51s, notably Oberleutnant Rudolf Rademacher of 11./JG 7 (four kills) and Walter Schuck of *Stab* and 3./JG 7 (four kills).

Knight's Cross-holder Hauptmann Georg-Peter Eder served as *Gruppenkommandeur* of II./JG 1 and II./JG 26 before flying the Me 262 with *Erprobungskommando* 262 and *Kommando Nowotny*. He later flew with III./JG 7, but suffered severe injuries when he struck his aircraft while bailing out after having engaged heavy bombers near Bremen on January 22, 1945 – he had fallen foul of the Mustang escort. By then Eder had claimed up to 21 victories in the Me 262, including six P-51s (plus a probable). (EN Archive)

AFTERMATH

Taken shortly after the cessation of hostilities in June 1945, a line-up of P-51Ds of the 353rd FG is seen at the base of the B-17-equipped 493rd BG at Debach, in Suffolk. The Mustangs are adorned in the 353rd's black and yellow checkerboard noses and their spinners are in the same colors. The group had fought Me 262s on numerous occasions during the final months of the war in Europe. (Author's collection)

It was in the aftermath of World War II that the "Cold War" began. Despite a draining and costly world war, the pace of military, aeronautical, and technological advancement became a race between the victors, some of whom emerged as "superpowers." Crucial to the standing of the victorious nations' arsenals was the continued development of the jet engine. Ironically, such was the acceleration in design and development, and probably to Professor Willy Messerschmitt's chagrin,

As American troops pushed deeper into southern Germany in the closing weeks of the war, so they discovered and uncovered the Third Reich's emergency jet aircraft manufacturing infrastructure. Here, a GI stops to inspect abandoned Me 262s in one of several "Waldwerke" ("forest factories"). (EN Archive)

that despite its undoubted but all too brief impact on the course of the air war in 1944–45, in the immediate post-war years, the Me 262 and its Jumo 004 turbojets quickly became viewed as obsolete.

Nevertheless, in the weeks after the cessation of hostilities, the Americans, the French, and the Soviets were all eager to get their hands on German jet technology, and all these nations did test captured Me 262s. On April 22, 1945, under the codename Operation *Lusty* (an acronym for Luftwaffe Secret Technology), steps were put in place by American Air Technical Intelligence to seek out examples of advanced German aircraft designs. Furthermore, a dedicated unit was established under Col Harold E. Watson to arrange the transport of captured "war booty" Me 262s to the US. 1Lt Roy W. Brown was one of the pilots assigned to Watson's team, and he recalled how, "After flying the P-47 for over a year, flying the Me 262 was a real thrill. We thought of it, at the time, as a real pilot's airplane – responsive, fast, and smooth." Altogether, ten Me 262s of mixed variants were shipped from Cherbourg to New York and then transported to various locations in the US for testing and assessment.

However, the US – one of the new superpowers – had already flown its first jet aircraft, the Bell XP-59A Airacomet, in October 1942. The aircraft was powered by General Electric I-16 motors that had been based on samples of Whittle W.1X gas turbines supplied by Great Britain – an echo of the partnership of the P-51 and the Merlin. The XP-59 was soon superseded by the Lockheed P-80 (later F-80) Shooting Star, which, although lacking the swept-back wings of the Me 262, saw widespread

Me 262A-1a Wk-Nr 500226 was operated briefly by the Industrieschutzschwarm Memmingen (Memmingen test facility defense flight) before being transferred to JG 7 in February 1945. After a further period at Munich-Riem, it was then flown by Oberleutnant Walter Bohatsch, *Staffelkapitän* of 1./JG 7, as "White 4" from Saaz, in Czechoslovakia, to the small military airfield at Dedelstorf, 67km north of Braunschweig, on May 8, 1945 where it was surrendered to US forces. Visible here is the warning applied by the Americans to the jet fighter's tail section for any aspiring souvenir hunters to *KEEP OFF*! (EN Archive)

service as both a fighter and a fighter-bomber in the Korean War. It was in the conflict in Korea that on November 8, 1950, the USAF (as it had become from September 1947) recorded its first jet-versus-jet kill when an F-80 of the 51st Fighter-Interceptor Wing shot down a Soviet-built MiG-15 – itself an unexpected development for American fighter pilots.

But in a further touch of irony, the F-80 proved so poor at carrying out ground-attack missions in support of troops in Korea that 80 World War II-era F-51Ds were pulled from US Air National Guard (ANG) units and shipped out to fill the gap with underwing rocket pod installations. In fairness, the F-80 had been designed as a high-altitude defense interceptor, much like the Me 262, but unlike the Me 262, it did not initially have underwing racks to carry bombs.

In the US, starting in June 1946 with the Aurora-based 120th Fighter-Interceptor Squadron of the Colorado ANG, units flew later variants of the Mustang – F-51Ds and F-51Hs – way past the 2,000-hour mark until 1955, when the last aircraft were sent to salvage centers from ANG units at Meridian, Mississippi, and Springfield, Ohio.

Between 1946 and 1949, a run of 12 "Me 262s" was built by Avia in Czechoslovakia as the S-92. Powered by Czech-built Jumo 004s, the aircraft were never assigned priority, as the manufacturer placed greater importance on building the Soviet Yak-23 jet fighter, together with the prospect of the MiG-15.

Arguably, both the Me 262A-1a and the P-51D can be viewed as among the finest warplanes in history, but against a post-war period of intense development and advancement, their legacies were remarkably short-lived.

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Me 262 cover art
On February 22, 1945, a small number of Me 262s from 9./JG 7 were scrambled from Parchim to intercept some of the thousands of Allied aircraft attacking targets in a concentrated effort to destroy Germany's transport system and communications network as part of Operation *Clarion*. Flying Me 262A-1a Wk-Nr 110808 'Black 11' that day was Knight's Cross-holder and 58-victory ace Oberfeldwebel Hermann Buchner, a tenacious airman who had transitioned from the ground-attack arm to jet fighters. Shortly after midday, near Stendal, the jet pilots came across a formation of 73 B-17s from the 91st BG that had been tasked with bombing the town's railway traffic control center. As they prepared to attack the Flying Fortresses, they also spotted P-51 Mustangs from the 352nd, 363rd, and 364th FGs on their approach to rendezvous with the bombers. The latter group, flying from Honington, in Suffolk, had 61 P-51s in the air, and Buchner quickly decided that, with his advantage of speed and surprise, and by approaching out of the sun, he would take on the dreaded escorts. With a burst from his four 30mm MK 108 cannon, he shot down P-51D-5 44-13994 flown by Lt Francis X. Radley of the 383rd FS/364th FG, which was seen to spin out of control in flames toward the ground from 10,000ft, its canopy still in place. Radley was reported as killed in action, having become one of 12 victories claimed by Buchner while flying the Me 262. (Artwork by Gareth Hector)

P-51 cover art
On February 9, 1945, Capt Donald H. Bochkay of the 343rd FS/357th FG was flying his P-51D Mustang as wingman to Capt James W. Browning and as one of more than 800 fighters escorting 1,200 bombers of the Eighth Air Force in raids on oil and transport targets across Germany. The 357th FG was escorting B-17s of the 3rd Air Division when, over the Fulda area, pilots spotted four Me 262s of I./KG(J) 54 sent up from Giebelstadt to intercept the bombers. The Luftwaffe jets were flying 4,000ft below, so Browning and he (in his assigned P-51D-15 44-15422) dropped their external tanks and gave chase. At this, the Me 262s split into two pairs, veering left and right, with Bochkay in pursuit of the latter pair. Following a high-speed climb to 28,000ft, he was able to cut off the jets, with the sun in his favor, and open fire with a long burst at the rearmost machine from 300 yards. While the lead Me 262 dived sharply away, Bochkay observed hits striking home against the cockpit and right engine of the other Messerschmitt. As large pieces of the aircraft fell away, the stricken jet began to rapidly lose speed. Indeed, Bochkay had to break right to avoid a collision. He later reported how, "As I passed very close to him, the pilot was halfway out of his cockpit. The ship then rolled over on its back and the pilot fell out. The pilot never opened his 'chute and the plane went straight on in." Bochkay then pulled away in a climbing left turn. He was credited with the destruction of an Me 262, his victim possibly being Oberleutnant Günther Kahler of 3./KG(J) 54, who served as *Gruppe* Technical Officer. His aircraft, Me 262A-1 Wk-Nr 110862 B3+GL, is believed to have been attacked by fighters and crashed near Neuhof, 11 miles southwest of Fulda. It is also possible that Kahler's jet had been damaged by defensive fire from the B-17s prior to Bochkay's interception. (Artwork by Gareth Hector)

Title Page
On April 17, 1945, Capt Richard Hewitt and his wingman, multiple jet-killer 1Lt Allen Rosenblum, from Duxford's 82nd FS/78th FG, chased a pair of Me 262s to Kralupy airfield near Prague, where Hewitt shot one of the jets down when it was on short finals to land. Rosenblum was in turn forced to crash-land minutes later after his fighter was hit in the engine by flak whilst strafing. Hewitt was at the controls of his distinctively marked P-51D-20 (44-64147) when he downed his Me 262. (USAAF)